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"In the four quarters of the globe, who reads an American book? or goes to an American play? or looks at an American picture or statue? *What does the world yet owe to American Physicians or Surgeons?*"

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TO READERS AND CORRESPONDENTS.

1. We wish it to be distinctly understood, that we neither have, nor will receive, any pecuniary compensation as Editor of this Journal. The motives which led us to engage in the enterprize, are announced in our prospectus, and will be found liberal, and wholly disinterested. To this subject attention is now called, with a request, that communications for the work, and all matters of correspondence relative to it, may be addressed to the publishers, Messrs. H. C. Carey and I. Lea, Booksellers, Philadelphia.

2. We assure our correspondents, whose communications have been *crowded out*, that we shall give to them an early insertion. Delays in this respect, we are aware, are too often unkindly construed, and which we have, consequently, at all times, endeavoured to avoid. Every number of our Journal has exceeded our declared limits, and the present one, by more than fifty pages. What further can we do in a spirit of accommodation?

3. By comparing the Bills of Mortality of New York and Philadelphia, the population of which is equal, it will be seen that the mortality in the latter city was greater the last two years. Without any invidious motives, for we really believe, *cæteris paribus*, there is no material difference in the average of the healthiness of the two cities, we deem it proper to invite the attention of our readers to an explanation of the fact as it now stands—and for this purpose, the communication on the subject, by Dr. Emerson, in our present number, may be advantageously consulted. We will only add, that the two epidemics, namely, *small-pox* and a form of *typhoid fever*, which have tended so largely to swell our Bills of Mortality, are nearly extinct, and that we are so rapidly reverting to our ordinary standard of health, that the official report of the last week shews a diminution of nearly one-half in our deaths—these being only *seventy*, while New York returns *ninety-six!*

4. Dr. Godman, whose last memoir on the *Fasciæ* appears in this number, has extended his researches and made several interesting discoveries. Messrs. Carey & Lea will shortly publish the whole in a small volume.

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Art. I. *Remarks on the Epidemic Bilious Fever which prevailed in Louisville, Kentucky, and its vicinity, in the Summer and Autumn of* 1821 *and* 1822. By John P. Harrison, M. D. Read before the Louisville Society for the Promotion of Medical Knowledge.

It is the first remark of the great reformer of modern science, in his Novum Organon, " Homo naturæ minister et interpres :" that man is so furnished with faculties, and endued with capabilities, as to be qualified to become the subordinate agent in elucidating and interpreting nature—that upon her he must wait, and learn from her lessons all that variety and diversity of intellectual attainment, which shall fit and prepare and adorn him for all that is useful and ornamental in life.

But instead of being the minister and interpreter of nature, how frequently has it happened, that man has become the poor slave of idolatrous submission to the opinions of his equally fallible and erring fellow-man—and thus instead of being the minister and interpreter of nature, he sits con-

tentedly down at the feet of him who is, perhaps, not more her interpreter than himself, but the interpreter of the opinions of others equally fallible—or the originator of conceptions as novel as they are unfounded.

Indeed if an accurate knowledge of a subject, says a very eminent philosopher, be in any proportion to the number and diversity of opinions advanced, or the labour and ability of the canvassers, then there would be little room to doubt on any important question connected with our profession.

But as the waters of a turbid lake, continues the same elegant writer, do not grow clearer by being frequently dashed together, but are darkened by the agitation, so there are many medical topics which assume a more confused and darkened aspect by a comparison of many conflicting opinions. The better way then is to suffer the waters to rest before we attempt to discover the secrets of the bottom—or when we approach a very interesting subject of investigation, come to the inquiry ungoverned by the opinions of others, as if we were the first inquirers. Under the impulse of these considerations, I shall not offer in the following paper, any review of the many and conflicting opinions advanced on the subject of fever—nor attempt a laboured analysis of the numerous errors, which I conceive are involved in some of those opinions—for even if my limitation of room did permit, I feel myself unable to the arduous task. I proceed, therefore, to the description of the history, pathology and treatment of the Bilious Epidemic Fever, as it appeared in Louisville and its vicinity, during 1821 and 1822.

As medical topography has a very close bearing and relation to a full and fair explication of the true character of an epidemic fever, I shall briefly advert to the situation of Louisville and the country around, as regards the peculiarities which favour the generation of febrific exhalations.

Louisville stands on an elevated platform, of alluvial soil, on the south side of the Ohio river, in north latitude 38° 10′, and about 8° west longitude from Washington City.

The site upon which the town is built, is exceedingly

rich and level. The soil in the neighbourhood of the town partakes generally of the same character of fertility, and evenness of surface. This remark is more especially applicable to a low and flat district of land, called "Pond settlement," which commences in the very town itself, and stretches in a south-west direction about twenty miles. This very fertile and level tract of land, which is from six to eight miles wide, is intersected with numerous ponds and marshes, and is clothed with the most luxuriant vegetable productions.

To the eye of the traveller there seems to be a continuous elongation of pond,* running parallel to the road to Salt River, which river empties into the Ohio, twenty miles below Louisville—the site of the town though elevated above the river, is as I have remarked, very level, and has always been singularly spotted with ponds, wherever any excavation in the surface of the ground favoured an accumulation of rain water.

The Ohio meets with an obstruction, a quarter of a mile below the town, to its current, from a large bed of firm limestone rock, which interruption produces what is known by the name of the Falls or Rapids of Ohio. A considerable portion

* Although not directly relevant to the subject matter in hand, yet there is a peculiarity connected with the phenomena presented in the aspect of the pond district of country, which as it goes to elucidate the formation of the large collections of water, and as it is an additional proof, if indeed any additional proof was wanting of a fact so well attested and established, of the social and constructive habits of the sagacious beaver, I will here notice in a brief manner.

It appears from all the traces now left about the ponds, that the largest accumulations of water have been induced by the artificial dams thrown up by the beaver. I have seen a mound of earth stretching near half a mile in an elliptical, or of a semicircular shape, of about four feet high, which was the proud results of their ability and power of "constructiveness."

The aborigines and early white adventurers, were in the habit of trapping a great many of these animals in this pond district of country, for the fur afforded by their skins. The flesh of the beaver is dark coloured, ill flavoured and tough—and except on a particular emergency, when the huntsman could obtain no better, never was eaten.

of this bed of rock is exposed in the summer and fall months to the sun, entirely destitute of water, after the subsidence of the periodical freshes. In the winter and spring the river is swollen by the mountain torrents, and the melting of the mountain snow, which, pouring down the Monongahela and Alleghany rivers, by their junction at Pittsburgh, form the Ohio—and then we have a large majestic stream flowing in a copious tide of turbid water, towards the Mississippi. But after the retrocession of the river into a narrower stream, the banks formerly inundated, are now exposed with all the deposited matter to the action of the summer sun.

The elevation in the winter and spring tides or freshes, above the ordinary summer bed of the river, is usually about twenty-five feet. The subsidence to the low water mark of summer, takes place generally in May or June, and it remains stationary commonly five months, till October or November, when the fall rains in the mountains commence.

There is a small stream, called " Bear Grass creek," which disembogues into the river immediately at the town, at the mouth of which some wharves are erected, and which forms the chief landing-place for boats. This creek bears the same character, as to its periodical overflows and summer retrocessions of stream, as the Ohio. Its bottom and banks, which are exposed near the town to the sun in summer and fall, are generally then very foul and muddy.

Above the town the creek and river banks are luxuriantly clothed with forest trees, which throw a deep shade over the margin of the streams, and afford a perfect protection from the solar beams. But there is erected on the creek, about a mile from town, a mill dam, which produces an almost stagnant accumulation of water, and on each side of which, little or no protection exists by the interposition of trees to the action of the summer sun.

The town is built of brick principally—its streets are wide and run at right angles to each other—but had but one street paved in 1822. The population was then about four

thousand five hundred. In the town there were at least eight ponds of larger or smaller dimensions in the summers of 1821 and 1822. Some of these ponds continued full of water all summer and fall: the most of them however were evaporated by the sun, exposing very foul bottoms. Such is the mixture of tenacious clay in our soil, that an accumulation of water is rarely absorbed but to a very limited degree—so that the slow and injurious process of solar evaporation is the mean of the removal of such water.

The pits of the privies have always been superficial, and in warm weather emit a disagreeable odour.

As regards the people and their mode of living, the same leading traits are common over the United States. More salted provisions, however, are consumed here than in the eastern states. Bacon is the staple commodity of meat diet in summer—bread made of Indian corn or maize, is likewise an article of diet much more used here than in the northern sections of our country. The demoralizing and injurious habit of taking bitters in the morning, and grog at or before dinner, prevails to a very considerable extent among us. There are many of our men who accustom their systems to these potations of whiskey, who yet may continue sober. But very many are thus seduced by a gradation of excess, which is more dangerous, because being less noticed, it does not carry an immediate sense of shame and alarm to the mind, into acts of brutal intemperance the most degrading and ruinous.

Having thus touched, in a cursory manner, upon the leading features of the medical topography of the town and adjacent country, I shall briefly give my views as regards the *fons et origo* of the epidemic fever.

There are two co-existing agents which always co-operate in the production of that vitiated state of atmosphere, which gives rise to an epidemic bilious fever. The first essential prerequisite agent is a hot sun, which is the great operating power in the generation of a diffused atmospheric pollution. The second co-existent, though not co-ordinate agent, is the material to be operated on. That a hot sun is essentially

requisite to the production of febrific miasmata, or to the generation of some change in the atmosphere, originating epidemic bilious fever, is, I think, established beyond disputation, by the fact that such an epidemic never prevails except in tropical regions, or in the hot summers of temperate climates. As to the material upon which the solar influence operates, there is still some dubiousness and diversity of sentiment. From the laborious researches of Bancroft, it seems generally agreed that putrefactive animal matter will not produce epidemic fever—and from the recent documents and arguments afforded us by Dr. Ferguson of the British army, it appears, that even vegetable matter undergoing the process of putrefactive fermentation, will not create the materia morbi—the elementary principle which we term miasm. To use his own language, "putrefaction and the matter of disease are altogether distinct and independent elements—that the one travels beyond the other without producing the smallest bad effect—and that however frequently they may be found in company, they have no necessary connexion."

Although I concur in opinion, under certain restrictions, with the views of these distinguished physicians, yet not without great limitation in some instances, are these views to be adopted.

The fallacy of medical testimony is admitted on all hands: but surely if we reject the many corroborative proofs afforded by various medical writers of the greatest accuracy of observation and fidelity of narration, as regards the generation and evolvement of febrific miasmata from animal and vegetable decomposition—we must harden our minds into a state of incredulity and scepticism, amounting to an abandonment of the best established medical truths.

There is sometimes a peculiar condition of atmosphere of a progressive tendency, which spreads over an immense portion of country, diffusing disease and mortality to an alarming extent. This constitution of atmosphere may exist independent of the local origin of miasmata, and seems to hover over and shed down its fatal influence, regardless of the minute and local, as well as the more general features,

which distinguish the state of the atmosphere and peculiar localities in different sections of a country.

To the able work of Noah Webster, I would refer for a clear exhibition of the history of such atmospheric constitutions, as afforded by the calamitous visitations of pestilence in the by-gone ages—and to the judicious remarks of Dr. Caldwell, contained in a former number of the Philadelphia Journal, for an exposition of the same opinion illustrated and confirmed, by reference to the condition of the atmosphere in several of the States during the few past years.

Leaving such generalities of medical truth to abler minds, I shall notice the particularities which marked the years immediately preceding our epidemic.

The summer and fall of 1819 and 1820 were remarkably healthy—they were very dry—but some of the weather was as warm as that of the subsequent years. In each of these years little rain had fallen in the spring and early summer months. The ponds in and near the town were evaporated and quite free of water before the first of July in each year. Even in the pond district of country there was little or no stagnant water. The river was low during both of the summers of the above years, and there was deposited on the shores and rocks near the town a considerable quantity of drifted wood and other matter, left by the subsidence of the river and creek.

During the spring and early summer months in 1821, we had an immense quantity of rain—the ponds were all overflowed, and the earth thoroughly saturated with water. It was early apprehended from the great quantity of water on the surface of the earth, that we should have a visitation of bilious fever. The summer was warm, and the atmosphere pretty well perflated with currents of air—but the wind came from the south-west, sweeping over the pond district of country. The south-west is our prevailing summer wind, and has to cross this tract of marshy land before it reaches us. This marshy tract of country is thinly inhabited—the hand of cultivation has cleared only a small portion of it, and a thick forest of tall trees spreads over

the ponds and marshes a deep shade, through which the sun scarcely penetrates.

This "pond settlement" was greatly afflicted during the summer and autumn of 1821, with intermittent and remittent bilious fever.

The town likewise, more especially the skirts of it, suffered considerably from the same fever. As similar features were common to the epidemics of 1821 and 1822, and the onset and progressive career of each was marked by the same stadia, I shall, in giving the history of the epidemic of 1822, comprehend the essential circumstances of both.

In the spring of 1822 we had an almost unprecedented quantity of rain—and during June, July, August and September, an unusual succession of heavy and continued showers. The rain, though it fell in excessive abundance and in heavy torrents, seemed to have no effect in cooling the atmosphere. There was a closeness and sultriness of atmosphere proving very oppressive during the summer months, which, with little or no abatement, continued through the night as well as day. During both the summers of 1821 and 1822 the musquitoes were exceedingly troublesome—infesting every house, and giving a constant interruption to sleep by their stings and the teasing noise of their wings.

But nothing conclusive could be deduced from their presence, as they troubled us even in our most healthy summers.

The winters preceding each of those unhealthy summers were as cold as ordinary in this climate—the Ohio being filled with ice, as is usual here in winter.

In speculating on the causes of the epidemic of each year—the general character of the atmosphere—its heat, aided, I think, by the constitution of atmosphere then prevailing in several of the adjoining states, (which co-operated with the malaria in increasing their power on the system,) with the co-existence of the ponds in town, and the diffusion of the marsh poison from the malarious district of land noticed above—must be assigned as the immediate sources of the fever. Neither the state of the river,

nor the foul condition of the privies, can be implicated as having a very powerful agency in the production of the epidemic—because the situation of both of these specified points was exactly similar in the healthy years. The laws governing the origin and diffusion of miasmata have been so ably treated of by Bancroft and Ferguson, that I need not expatiate on them. Yet the manner in which miasmata impress the system appears to me so interesting a topic, that I will make a few observations in relation to my own views of this point of pathology.

There are four surfaces on which miasmata can impinge, and produce their impression, namely—the stomach, through the œsophagus—the skin, either by absorption or nervous excitation—the schneiderian membrane—and the mucous tissue of the bronchiæ. I am well assured that it is impossible to settle this disputed point by mere argumentation—for in the wide extent of the field where each one may rove, and find room to rove in his own way as far as he chooses, all may be lost in error, and yet each in his own peculiar path. I shall, therefore, only bring forward a few facts which militate against the first three notions, and from which I may deduce a confirmatory proof of the correctness of the last supposition. From the facts related by Bancroft, Johnson, Rush, and other eminent writers on fever, we know that the mere inhaling of a polluted atmosphere, even for a few hours, will excite very fatal attacks of bilious fever. Thus, says Johnson, not a single patient who slept for even one night at the fatal island of Edam, escaped the fever, and every one died except three or four who were under the mercurial impression.

Lind states that when sailors were sent to an infected shore to water at night, they were sure of being attacked with fever.

Rush says that in 1793, persons merely passing through Philadelphia, or remaining but a very short period in the city, imbibed the vitiated atmosphere to a sufficient degree to produce yellow fever.

From these facts are we not warranted to draw the con-

clusion, that the miasmata could not have been taken into the stomach, agreeably to the theory of Dr. Miller and other distinguished American etiologists?

How could the miasmatic particles get into the stomach when the patient was asleep? Besides, if miasmata acted primarily on the stomach, some nausea or distress of that sensitive organ would be excited.

The opinion of the skin being the medium of communication through which malaria act, either on the sentient extremities of the nerves, or by which they are absorbed into the blood, is, I think, a very gratuitous notion—the skin seeming to be a very "unhandy engine for carrying" miasmata. Covered as the true skin is with a comparatively dense, insensible cuticle, which even warm fluids and friction with unctuous substances hardly renders permeable, how can an exceedingly subtle, aeriform substance penetrate it—or how affect its nerves?

If miasmata act on the olfactory organ, then some direct impression would be made on the brain—and with Dr. Clutterbuck, we should have fever in the brain as its salient point. But as every external sense is acted on only by its own peculiar stimulus—for the auditory nerve will not be affected by heat or cold—nor will the tactual organ, the skin, be acted on by sound, nor the gustatory apparatus perceive odours: is it not therefore a question to be solved, whether the olfactory organ can be impressed by a substance which has no odorous quality, and the properties of which can not be recognized by it?

Besides this negative argument, there are persons who habitually take snuff, or those whose olfactory perceptions are destroyed by disease, who nevertheless take bilious fever.

This point, with the other two opinions mentioned above, I think are not tenable—"the bed is too short whereon for a man to lie," unless we make it the bed of Procrustes, where, by elongation and lopping off, we make every case suit, and bring every fact to tally.

The very ingenious Bichat has, in his divisions of the systems of the body, afforded us a ground on which we

may erect a more consistent and rational explanation than any of the above mentioned suppositions. The mucous systems he divides into the gastro-pulmonary and genito-urinary. The gastro-pulmonary mucous system includes the lining tissue of the nares, fauces, œsophagus, stomach, intestines, trachea and bronchiæ. In adverting to the intimate relation of action and sensation between different parts of this gastro-pulmonary mucous system, we perceive how pulmonary diseases affect the rectum, as is frequently observed—how phthisis may arise from dyspepsia—how worms in the alimentary canal excite croup, with many facts of an analogous kind, given by Whytt and other eminent writers.

It is beyond our ability to say how a train of diseased action is propagated from one part of the mucous system to another part—how the rectum should become diseased from the state of the lungs—or how gastric irritation induces an affection of the pulmonary organs. In all argumentation there are first principles, or elementary propositions, upon which we must ground our reasonings. So in medicine we must have primarily acknowledged truths, or else we must "take the downward *a priori* road," and terminate our labours in little better than the "shadow of a dream."

Nor does this opinion rest on a base so narrow as analogical deduction only. The well accredited instances where the system was impressed in a very powerful way, through the lungs, are altogether demonstrative of the fact, that the mucous tissue of those organs can receive and impart an irritative sympathetic impulse to the stomach, and consecutively to the other abdominal viscera, the brain, blood-vessels, &c.

That the inhalation of vaporous substances can only act by exciting the bronchial apparatus, and from thence have their influence propagated through the system, is abundantly confirmed from the strong, vivid and diffusible effect produced by the nitrous oxide. In inspiring it, the nose is compressed with the fingers, so that its action can in no degree be explicable by reference to the schneiderian membrane.

Professor Silliman states, that when he was in England attending the lectures of Mr. Accum, in making experimental researches upon some of the arsenical combinations, he inhaled for a day or two the arsenious vapours extricated—that the injurious impression was not *ictu solis*, but accumulative—that he became feverish—lost his sleep—his chylopoetic viscera were deranged—his stomach more especially was much disordered, and he had to abandon, for a time, his chemical pursuits. It is well known that in the immediate vicinity of smelting establishments, where arsenious vapours are given out, as the Cornwall copper manufactories, the atmosphere around is so poisoned that even inferior animals, as well as the human system, are greatly injured by the noxious vapours. Cows, says Paris, in such situations are gradually so much diseased that they drop their hoofs, and are seen crawling about in a miserable condition on their knees.

The carbonaceous oxide given off in the combustion of charcoal, will induce death. When persons sleep in a room where charcoal is burning in an open vessel, the effects very closely resemble such as are produced by the internal administration of poison, and have been mistaken to such an extent as to lead to an unjust and very injurious crimination. Mercurial vapours will readily induce salivation when they are inhaled.

From all the foregoing facts, I think we are justified in strenuously contending, that miasmata influence the system only, by impinging on that part of the gastro-pulmonary mucous system which lines the fauces, trachea and bronchiæ, and from thence an irritative sympathetic train of action is imparted to the stomach—producing a sub-acute state of inflammation in the mucous coat of that organ, and consecutively bringing in its cycle of diseased movements, the liver—disturbing the portal circulation—and from thence the heart and blood-vessels, the brain, muscular system, &c. are implicated.

This generalization of the facts presented by this subject, I think most accordant with the principles of just philo-

sophy, being more comprehensive, and susceptible of being more extensively applied toward the explication of analogous phenomena.

The dissipation of even theoretic error is useful—for if clouds and shadows rest on any part of the path of the physician, his mental view may be dimmed to the perception of practical truths, over or around which the shades may hang—and assuredly his footsteps are rendered firmer and his march accelerated, by a clear perspective of the line of advancement.

But I must hasten to something more palpable to observation, and practical in its bearings—the history of the disease.

The fever of 1821 commenced later in the summer than that of 1822, and was of a milder and much more tractable nature—but as both bore so many features of similitude, I will not particularize the course of each separately, but sum up in a few remarks all I have to say of them, in a notice of the onset—progression—subjects most obnoxious to the attacks—the manner in which they made their attacks—the symptoms—stages—modes of favourable and unfavourable termination—pathology as revealed by dissection—and lastly, the treatment.

From the general aspect of the weather, the excessive quantity of rain that had fallen, and the oppressive heat of the spring, there was much apprehension, early entertained, that a sickly summer and fall were approaching—more particularly was this apprehension entertained by the inhabitants of the "pond settlement." An inhabitant of that district of country, who from much and bitter experience, could well infer the coming summer's healthiness or unhealthiness by precursory indications from the state of the ponds, told me, early in the spring of both years, that he strongly suspected they would be severely visited by bilious fever. In a greater or less degree they have fever there every year—and when a wasting epidemic sweeps through our land, its visitations light with greater violence and more afflicting mortality on them. The epi-

demic of each year first commenced its ravages in this district, and spread with rapid and regular progression towards the town. The citizens living in the suburbs nearest the ponds, suffered earlier and much more severely than those who inhabited the central parts of the town. In June it commenced in the pond district, and reached its full maturity of epidemic power in the central part of the town in August.

Neither age, sex, nor colour, could claim a complete immunity from its attacks. For the oldest citizens who had lived in the midst of former epidemics with safety, were attacked, and some of them swept off. Even infants at the breast were brought under its dominion—the seizures on their tender and irritable constitutions, being frequently in the form of cerebral convulsions and cholera infantum, with high excitement, which were very fatal. One gentleman, living in the pond district, lost two children within four days of each other, who were apparently in health previously to the attack of convulsions—each of whom died in thirty-six hours after the attack. Old age itself with its decrepitude and feebleness of vital energies, sunk under the subduing power of the epidemic.

The negroes were most exempt from its attacks—and not half as many in proportion to the relative population fell victims to the fever, as the white inhabitants.

Strangers or recent settlers, especially if they were of the dissipated irregular class, were most liable to the fever, and with whom it proved also more fatal. Rather a greater number of men died than females. At one time in August and September, out of about twenty-four physicians, there were but six or seven who could practice, and some of whom were restrained in their professional exertions, by the illness of their families. But two physicians fell victims to the disease—one in each year.

Among the infantile population early each season we had pertussis, sometimes complicated with cholera infantum—very few children escaped with this complication of affection. The dysentery among adults was very violent, and

in some instances quickly fatal, early in the summer of 1822. But both it and every slighter disease were merged and lost in the overwhelming power of the fever.

The fever generally attacked with listlessness, erratic indefinable sensations of uneasiness, pains in the limbs, chilliness, nausea, or vomiting, sense of emptiness, or oppression in the stomach, diminished energy of mind, pain in the lumbar region, headach, thirst, and flushes of heat. Sometimes its onset was not marked by any premonitory symptoms—and at others great oppression, headach and shivering ushered it in. But few cases fell under my observation in which previous chilliness did not occur. In some very malignant attacks there was no reaction of the system, but the skin of the patient continued cold, with pain in the head, and an insupportable agony and weight in the stomach, which one young gentleman, who died, said was like Mount Atlas on his breast. The skin in these cases was of a mottled, bluish, or of a bronzed appearance, cold and covered with a clammy sweat—constant vomiting often was present, great jactitation of the body, with a total disregard of personal delicacy. This last symptom shewed the shattered state of the mind, and denoted great danger. Even the constraining feelings of female delicacy was lost in the recklessness and agony of these malignant attacks. The patient would throw, vehemently, the bedcloaths off—toss from side to side with the most distressing stare of the eye, and long, heaving respiration.

For the purpose of communicating with greater accuracy the several forms of the disease, and distinguishing the pathology of each variety, and thus laying down a better foundation for well defined practice—I shall divide the epidemic into three grades or varieties—the mild intermittent—mild remittent—and the malignant intermittent and remittent—comprehending both of these last grades under that head.

We have had such abundant disquisitions on the simple intermittent, and the method of treating it has been so fully laid down, both by the regular systematic writers and phy-

sicians, who have merely detailed their clinical experience, that I shall not protract these remarks by any laboured exposition of the pathological, or therapeutic difficulties surrounding this very common form of bilious fever: but merely observe, that the tertian and quotidian, more especially the latter type of intermittent fever, during the above years, were not so manageable by bark and kindred remedies, as I had previously seen them. Emetics given several times, either in the fever or during the intermission, with mercurial purges, and sometimes venesection, would terminate the intermittent without any additional remedial measures. If tonics were tried anterior to free evacuation from the alimentary canal by emetics and purges, they did no good—nay they evidently did much harm. The patient was either thrown into a state of remittent fever, or his paroxysms returned.

After having tried a variety of tonic remedies in intermittent fever in several cases, with no advantage, I resorted to bleeding, with the most signal success. I believe that patients frequently eat too much. In such cases where I suspected that to be the cause, I exhibited an emetic of ipecacuanha and tartar emetic, with desired success. Evacuations having been premised, I employed the combination of bark, snake root and salt of tartar, with great advantage. Fowler's solution of arsenic in larger doses than ordinary, and more frequently repeated, I sometimes found triumphant when other means failed. I also gave one grain of the sulphate of zinc, with two grains of camphor, and one half grain of opium, made into a pill, and repeated every two hours previous to the expected exacerbation, with great utility.

I rarely salivated for the cure of intermittent fever, and never without there was some evidence of visceral derangement. Intermittents were, however, sometimes complicated with dropsy of the lower extremities, or of the abdomen, and such cases were generally accompanied with visceral congestion, and here the mercurial impression was necessary. But this congestion being slight, was

curable by mercurial purges, without inducing salivation. Bleeding and emetics, with mercurial cathartics, often removed both the intermittent and dropsical effusion. But where the liver and spleen were enlarged, the abdomen tense and tender on pressure, and the fœcal evacuations much vitiated, I resorted to a gentle ptyalism with unequivocal advantage. However, it is a great error to suppose that salivation, pushed to the greatest extent, will arrest in every instance intermittent fever. I have known a singular alternation of action occur in many instances, between the mercurial excitement, and the intermittent. If a quotidian, which was the most frequent type, the chill would come on at the period of its established onset —fever ensue, and the paroxysm terminate in sweat, with a complete suspension of the mercurial excitement, from the commencement of the cold stage to the breaking out of free perspiration—then the saliva would recommence flowing, and thus the poor patient be literally carried from Scylla to Charybdis—till perhaps by the prompt administration of camphor and opium the intermittent was arrested, and then the mercurial influence would gradually subside.

The indiscriminate employment of mercury, assuredly deserves reprehension—for to rashly engage a giant's arm to overcome a pigmy, is provoking the giant to turn his strength against you, whilst perhaps the weak and puny antagonist escapes. But I shall discuss the mercurial practice more fully when I come to treat of the remittent forms of the epidemic.

Among the sequelæ of intermittent fever, I must notice pulmonary affections. In the summer and fall of 1821, I attended, in conjunction with Dr. Smith, a small hospital, in which we had, among many other patients in the course of three or four months, four patients with every symptom of pulmonary consumption, arising from the protracted attacks of intermittent fever. There may have been a constitutional tendency in the persons to the pulmonary disease, which was awakened into activity by the intermittent. Of

this fact we were certain, that the continuance of the intermittent had a very decided agency in exciting the disease of the lungs. In two men whom we examined after death, the lungs exhibited every mark of true phthisis. To one we gave the nitric acid with opium dissolved in it, with perfect relief, who had hectic fever, and upon whom we had unavailingly tried the mercurial impression and other remedial measures. This man recovered his health and was dismissed the hospital, and whom I have seen since, enjoying good health. The fourth one thus affected was partially relieved by the remedy, but eventually died, and was not examined.

In the pond district of country adverted to above, in which, as I have said, intermittent fever is very rife, and where the disease in a greater or less degree prevails every year, several cases of consumption have fallen under my observation, which proved fatal.

These were cases of hereditary phthisis, and might have proved fatal in any situation in a climate so fluctuating as this. One of the patients had exacerbations in 1822, exactly analogous to intermittent—the tongue was furred, and the intestinal secretions vitiated. I treated her with evacuating medicines, and the symptoms left her. She died of phthisis last winter. She had been affected with symptoms of phthisis for five years before her death, and had lived in the pond district for fifteen years. Another lady died of phthisis who had been raised there, and her mother fell a victim to the disease though she had inhaled this malarious atmosphere for twelve years.

I could multiply facts of a similar kind, from the practice of other physicians—and I now have by me three cases given me by a judicious practitioner, where, as he says, pulmonary consumption was evidently superinduced by the protraction of the attacks of intermittent fever. And I may here remark, that from the most careful inquiry, and diligent comparison of the information thus derived, into the character of the diseases of the western country, I am justified in saying, that phthisis pulmonalis is as frequent and fatal a disease in this town and its vicinity, even in the

pond district of country, as any where in Kentucky, or in the adjoining States.

With these observations on the mild intermittent fever, as it occurred in the above years, I shall now notice the other forms of the fever—and next in order the mild remittent. But before I discuss the mild intermittent, I think it relevant to state, that the intermittent of ordinary years is more tractable to the tonic plan than the above.

The milder form of the remittent attacks generally came on with the usual symptoms of fever—the outline of the mitigated form of attack is given above. It is impossible, in no matter how correct or minute a delineation, to fix the diversified phenomena of a disease as it appears in the variety of cases seen by the physician—or draw a portrait which will suit every case, when the features are incessantly changing their expression. All we can do, is to point out the resembling lineaments of analogous cases which we desire to group together—and separate those forms of morbid appearances, according to the principle of dissimilitude, when they are hostile and repugnant in affinity to each other.

I am well aware that cases of the milder forms of attack, either from bad treatment or delay of active depletory measures, or from irritants applied to the system, did sometimes assume the darker aspect of the malignant variety—but for the purposes mentioned, I shall keep up the distinction.

In ordinary cases of the mild remittent bilious fever, one, two, or three bleedings were generally demanded. When there was much pain, whether in the head, back or limbs, with flushed face and hot skin, the pulse active, I bled copiously, and at the very onset of the inflammatory stage. Here the physician truly operates on the vantage ground—and when he faithfully relies on the lancet, and in that reliance employs it boldly, he may always rejoice in the retrospection of the treatment.

The ideal and spectral train of evils conjured up by the notions of debility here, have slain their thousands—or so fettered the hand of depletion as to amount to almost a

"meditation on death." After bleeding, with a full and rapid stream, until a decided impression was produced on the pulse and pain, I commonly gave an emetic of ipecac. and tart. antim. and on the operation of the emetic being over, a large dose of calomel, or calomel and jalap. If the febrile excitement rose again, I bled with the same relief, and administered another dose of calomel—determining it more actively to the bowels by epsom salts and calcined magnesia. In the mean while cold affusions were employed. If the fever continued without a complete arrestation of it by the above remedies, more or less vigorously pursued, as the case demanded, or the state of the case admitted no more depletion by the lancet, then I applied a large blister over the stomach, covering likewise the region of the liver—gave small doses of tart. emetic in a solution of epsom or glauber salts, and repeated the cold affusions. But if the fœcal evacuations were vitiated—of a dark colour and very fetid, then the calomel was repeated—at the same time continuing the saline purgative. A strong tea made of senna and salts is a very powerful purge, and was highly useful. If the fever was not subdued, and the tongue looked foul, I continued the purging plan, till by keeping up an artificial diarrhœa, the febrile excitement abated.

The tongue was, however, no sure criterion alone, but taken in connexion with other symptoms, proved a safe guide.

The above measures faithfully and perseveringly employed, generally arrested the fever in five, six, eight, or ten days—sometimes however it ran on to two or three weeks. And here I would remark that I never saw one remittent bilious fever obey critical days—nor pause in its career to pay nature such a great and respectful deference. By this treatment, the fever commonly came to a favourable termination without much or any critical discharges—but the tongue became cleaner in its aspect—the intestinal discharges assumed a yellow colour—the skin felt soft—the thirst, morbid vigilance, and restlessness abated gradually, and all the functions were restored to their pristine regularity of movement.

Yet, if the fever continued in despite of the depletory measures actively urged, and the tongue became dry and of a dark brown aspect, or much coated with a thick mucous secretion, with a starchy adherent matter about the teeth, the pulse frequent, quick and compressible, and the intestinal evacuations of a vitiated colour, then the employment of small doses of calomel, with or without opium, and antimonial powder, were demanded. The typhoid stage of bilious fever can generally be prevented by active depletory and antiphlogistic measures—but if a strong tendency to the typhoid stage, as I consider the above, should manifest itself, then all the talent, assiduity and vigilance of the attendant physician is called in requisition: If he stimulates, in a majority of cases of this sort, he aggravates the bad symptoms—if he actively purges, the patient sinks deeper into the prostrate condition which he is anxious to prevent. I have done injury, I must confess, by purging in this state of the disease: I lost a very respectable patient by one dose of salts, which actively purged—his system sunk under its effects, and all my subsequent efforts could not repair the injury thus done.

I have seen much injury likewise, from bleeding in such a case—not that some protracted cases of fever will not admit of the lancet, but the remedy must be used with very great discrimination.

Stimulants, and even bark, given too early in this stage of fever, increase the heat, restlessness, and heavy, dull feelings of the patient, and are to be employed with much judgment. But blisters to the neck, wrists and ankles, with small doses of calomel, and antimonial powder, or tart. emet. with opium and camphor in small portions, repeated every three or four hours, are very serviceable. I did not give the calomel in such cases with an intention to bring on sudden and copious ptyalism, but merely as an alterative—to change the secretions of the liver and alimentary canal, and prevent the deposition of coagulable lymph taking place in the structure of the important viscera—upon which process depends organic lesion. In this stage of fever the

mild nutriments, such as rice water, milk and water, thin chicken water, &c. were given.

If the patient continued to sink till the system became comatose, I then resorted to more diffusible stimuli—such as volatile alkali julep—camphor and opium in increased doses—bark, in substance or infused in snake root tea—with the free use of wine, or good sound porter. This last article I have much confidence in, having seen it employed in very bad cases of the kind with great utility.

There are cases of this character that sometimes keep up the anxieties and painful attendance of the physician for days and even weeks. But at times he is gladdened with the bright realization of his hopes—his patient is restored to the enjoyments of life from the shadows of the grave—or in any event whatever, he may gather in a retrospection of the case, the elements of that practical skill which will guide him to a more successful future exertion.

The next and last variety of the epidemic I am to treat of, is the malignant. As the intermittent type was as fatal in proportion to the number attacked as the remittent, and as the treatment, under certain modifications, was essentially the same, both will be comprehended under the malignant variety. And as nothing has yet been said by me of the pathology of the epidemic, I will here advert to the nature and seat of the disease as manifested by the morbid phenomena, and the appearances presented by *post mortem* examinations.

Of the highly inflammatory nature of the fever, there can scarcely be a doubt. Not only did every symptom, properly interpreted, denote such to be its character, but the *post mortem* appearances afforded by the stomach and intestines, were completely illustrative and corroborative of the opinion. I regret to say that I did not examine a single brain during either of the above years, but had an opportunity of seeing the brain of a patient who died of malignant intermittent, during the past summer, in which there was considerable effusion, with but little vestiges of inflammation. In the majority of cases the brain was

disproportionally affected, the mind being generally calm though subdued—and when much shattered, appeared to suffer from the excessive irritation and pain of the other organs. Indeed the cerebral affection, when it did not occur in children, if not amounting in adults to delirium ferox, appeared, by dividing or subtracting from the inflammation and congestion of the abdominal viscera, to lessen the danger of the case.

In several subjects examined by me, there were minute particles of dark coloured mucus floating in the stomach—the internal coat of which was inflamed—with marks of intense inflammation about the pylorus. The colon in one subject was much inflamed—in another several inches of the ilieon were sphacelated—the gall bladder was generally empty—in one, however, it was gorged with dark inky bile.

The spleen was generally distended with blood—the distention was in proportion to the duration of the case, or the marks of inflammation in the stomach. The liver was unexpectedly found healthy in a majority of cases—very little vestige of any disorganizing lesion, or structural alteration being seen in its texture. I do not say that the liver was not implicated in the inflammatory action going on in the abdominal viscera. I only relate what was observed in the examination of the dead body. From the symptoms presently to be related, it will be seen that the liver in its functional actions was greatly deranged.

In the malignant intermittent, the attack came on with a chill—much oppression, pain in the back and head, burning and sense of pressure about the scrobiculus cordis, vomiting, or great nausea and distress of the stomach. The system in such cases was greatly depressed, and reacted with much difficulty, as was evidenced by the mottled or bronze appearance of the skin, coldness of the extremities, and the feebleness of the pulse.

When reaction took place, the sense of coldness ceased—the patient complained of incessant and insupportable thirst, which when gratified, increased, or brought on vomiting. The tongue was coated with a thick mucous se-

cretion, or looked like boiled tongue—and sometimes very dry and hard to the touch. The patient was always better early in the morning, but about nine or ten o'clock A. M. the chilly fit was renewed, and the acme of the fever was about three or four o'clock P. M.

Several patients died in the chilly stage, after it had recurred only two or three times.

The only points of difference worth noticing between the intermittent and remittent types of the malignant variety, were the flattering intermission, the exacerbations being marked by a chilly fit, and the bowels being more susceptible to the action of purgative medicine, though the fœcal matter was always vitiated. The intermission was a dangerous illusion, as it was apt to seduce the mind of the practitioner from a regular plan of depletion, and make the patient rather latitudinarian in conduct. The oppressive load about the stomach continued in a slight degree, and the tongue was coated as it was previously, during these flattering intermissions. The intermission lasted commonly two hours. If tonics were given during the intermission, or any improper article of ingesta taken in, then the patient became restless and thirsty, pain in the back and head came on, and the chilly fit or tremors would quickly succeed.

In such cases when I was called in during the chilly fit, which generally lasted about one and a half hours, I exhibited twenty or thirty grains of calomel, applied warm bricks to the feet, covered the patient up in bed, and administered snake root tea quite warm, in small doses, till reaction ensued. After the development of the febrile excitement, I then employed the lancet, and gave epsom salts, or some such article to determine the calomel more actively to the bowels. The reason why I gave the calomel in the cold stage was to tranquillize the stomach—gain time, which was very precious in such a case, and make such an impression on the bowels, as would favour the evolution of the actions of the system, and excite actively the peristaltic movement. I have never employed the lancet in this chilly or depressed state of the system, but have no doubt

that where this stage of congestive depression is protracted, blood drawn in a small stream would highly favour the reaction of the system. The sagacious mind of Sydenham pointed out the great benefit of bleeding in such a stage—and our illustrious countryman Rush, has inculcated the same practical lesson. No matter whether we term it the suffocative or congestive stage, the pathological principle is the same, and a similar practical deduction is to be drawn from it.

The malignant remittent form was more general than any other form, and much the most fatal. After slight chilliness, the system was prostrated with great pain in the back, nausea or vomiting, and a pungent pain and oppression at the stomach, long, heaving respiration, great restlessness, &c. If the extremities were warm at the onset, they became gradually colder to the touch—but not to the patient's sensations, as the case advanced, till the skin of the legs and arms grew damp, soft, and clammy. The restlessness and feverish heat of the patient increased—the bedcloaths could not be borne, such was the insuppressible sensation of cutaneous heat, and internal agony now experienced. The tongue was thickly coated, the thirst great, the stomach irritable, bowels torpid, and if evacuated the fœces were dark coloured, or like drawn tea leaves, and very fetid—in some instances so acrid as to irritate the rectum, producing great pain.

In one case attended by Dr. Galt, pain and inflammation were induced in a poor woman, who in the act of helping her husband, ill with the fever, out of bed, had a portion of his fœcal evacuation dropped on the top of her uncovered foot. The fœces sometimes looked like tar, and were evacuated in a very partial manner, with small cheesy lumps of a yellow or whitish colour intermixed. On the sûrface of the body of some patients, blotches or whelks of an irregularly circumscribed shape, and hard upon pressure, made their appearance on various parts, though more especially infested the arms and thighs. To some they gave much ir-

ritation, while to others they were very little troublesome, only exciting an itching sensation.

The stomach ejected sometimes a fluid of a green or dark appearance, in the worst cases mingled with flakes, or particles of a dark coloured mucus, but not like coffee grounds. Every case, however, died, where I saw this last kind of matter, and the stomach in all such cases was, upon examination, found highly inflamed. In other instances a great quantity of bile was vomited up—which was always a favourable symptom.

Having expatiated as fully as the space to which I am limited, will permit, on the history, pathology and semeiotics of this last variety, the malignant intermittent and remittent—I shall next give my views of its cure. And here I must be permitted to remonstrate against those physicians who dogmatically pronounced on the correct treatment of a disease they never saw—or if they saw a few cases, were not properly qualified, from a scope of observations so narrow, to form a sound judgment on the subject. To speculate a priori on the character and treatment of a disease we never saw, is as wild and fanciful a species of excogitation, as can well be indulged, and never fails to lead to the most erroneous and dangerous consequences.

What I am now to bring forward is to be relied on as the result of not only my own observation and experience, but may be confided in as the result of the observation and experience of the most successful and enlightened physicians in this town.

When there was pain in the head and back, great thirst, vomiting, and oppressive feelings with pain about the stomach, restlessness and long, heaving respiration, I always bled, and very copiously, with a full flow of blood—no matter what was the state of the pulse, the bleeding was demanded. The pulse was no criterion in this variety of the fever—it was sometimes full and strong, when the excitement was not suffocated. But most generally it was small, hard and quick. It sometimes alternated remarkably,

being now full and labouring, and then suddenly becoming hard and small.

After producing a decided impression even to *deliquium animi*, and finding the pains abated, vomiting and other bad symptoms relieved, I then gave twenty or twenty-five grains of calomel.

The benefits of venesection can scarcely be realized in its immediate effects, except by the anxious physician, and more particularly the suffering patient. We read of the powers of enchantment in works of extravagant fiction, when by a stroke of the magician's wand, all nature around was transformed from darkness to light, and the poor enthralled captive being set at liberty, rejoicing with the feelings of a grateful heart in his deliverance. He who has seen, and more especially felt the astonishing effects resulting from copious bleeding in this stage of fever, can easily place himself in a state of feeling analogous to the liberated captive.

The patient frequently, after tossing for hours in a most perturbated and restless way from one side of his bed to the other, and tormented with the most distressing load about the stomach, upon losing twenty, thirty, or even forty ounces of blood, feeling composed and tranquil, would often thank his physician for the operation, and turn over gently in bed to take some repose. This repose was not of long duration—the pains recurred and the patient became restless again, but the symptoms were not so violent—and venesection was again, after a lapse of some hours, or a day, resorted to with the same beneficial consequences.

The large dose of calomel sat better on the stomach, and produced a much more powerful impression on the bowels and liver, than smaller, frequent, teasing doses. These were more apt to nauseate and distress the stomach, than the large doses. The twenty grains were retained, provided drinks were interdicted, for even the smallest quantity of the most bland fluid would bring on vomiting. After giving the calomel, I directed the patient to hold some ice in a linen cloth in his mouth to quench the great

thirst, but allowed him to take no drink, with the exception in a few instances of a small quantity of toast water. As I have said above, even the mildest fluid would excite vomiting: and I had therefore most commonly to prohibit all kind of drinks. In about four hours after the calomel was taken, I gave small doses of calcined magnesia and epsom salts, or some such remedy, to assist the operation of the calomel. I waited thus long, that the calomel might produce some impression on the liver, and calm the anti-peristaltic movements of the stomach. If the stomach did not retain the first dose of calomel, and there was pain and heat about the præcordia, and restlessness with febrile anxiety, pretty active depletion was again called in requisition. After the reduction of the above symptoms, the stomach would retain the purgative medicines, given to aid the action of the calomel. Senna and salts, jalap, castor oil, enemata of a stimulating kind, were all demanded, with other remedial measures of a similar kind. The tartar emetic injection, I did not find as powerful as I expected. Perhaps some of the disappointment is attributable to the great torpor which pervaded the intestinal tube. Yet I think the muriate of soda injection more powerful.

When the irritability and vomiting continued, the medicines being incessantly rejected, the bowels discharging little or nothing, and the little discharged very fetid and dark coloured, I repeated the large dose of calomel, and applied a blister over the stomach. And if the system would not admit of more depletion by the lancet, and the bowels yet torpid, I then continued to give the calomel in the twenty grain doses, twice or thrice a day, till the stomach became tranquillized, the bowels operated on copiously, and the general symptoms of visceral congestion removed.

That practitioner is unfit to discharge the high responsibilities of the task imposed on him, unless he feels prepared to go onward in the career of his duty, unmoved by the clamours of an unreflecting populace, and undiverted from his line by the seductive solicitations of fashion or

interest. We all admire the elevated grandeur of Cato's mind. Left alone to confront the usurper of his country's liberty, he stood forth as the noblest object of human greatness, scorning the baseness and the guilt of the inflictor of slavery—

> "Et cunta terrarum subacta,
> Præter atrocem animum Catonis."

Influenced by disinterestedness of feeling, and anxious to save his patient, the physician is called on at times, not indeed to oppose embattled legions, but to overthrow prejudice, ignorance, and medical fashion—the great originators of error in medicine—and he is forced to employ at particular emergencies, the most powerful and efficient remedial measures his art affords. Placed in a situation of this kind, were the Louisville physicians in the most malignant attacks of the epidemic. They saw their patient struggling under the power of a disease which must quickly consign him to the grave—and knew that if they intended to interpose, the interposition must be prompt and energetic. Circumstanced thus, with their stand as it were on the confines of life and death, and looking around for some remedy by which to combat the disease, they fastened on that potent remedial agent, which with a giant's power had accomplished such wonders in the profession. Confiding, after the lancet, in its powers, they gave it a fair trial, and the result was altogether satisfactory.

But to particularize. I have given sixty grains of calomel, in twenty grain doses, for four days in succession, to the happy recovery of my patient, and never found, in such cases, those dreadful effects from its liberal use which have been alleged: not that I deny that bad effects have resulted from excessive mercurial excitement. But in the above described cases, I never witnessed such mischievous consequences. Neither did I push for salivation alone. I kept a steady eye on the state of the bowels, and rarely gave opium with the calomel—and if the bowels were freely evacuated by the first two or three doses, the stomach became composed, and the fever abated—then I withdrew

the calomel entirely, more especially if the gums were manifestly touched. Yet it was very difficult, nay almost impossible, to subdue these malignant congestive forms or grades of the fever, without the mercurial impression being induced. Sometimes a very flattering and cheering intermission would occur, and the physician leave the case under the most certain expectations of speedy recovery, when in the course of an hour or two a chilly paroxysm would come on, and his patient die, before the system reacted. Stimulants, such as brandy, wine, laudanum, &c. appeared to do no kind of good—they only aggravated the inflammation, or engorgement of the abdominal viscera: except where the patients had been previously depleted, I did not lose a single one that I salivated, in the intermittents of the malignant variety. In the remittent form of such attacks, ptyalism was not so indispensable—though it was a sure sheet anchor in both varieties.

Emetics, in these gastric inflammatory cases, were extremely dangerous. The nausea and vomiting, instead of being indications of any foulness of the stomach, were here manifestations, in connexion with other symptoms, of an inflammation, or strong tendency to it, of the stomach and intestines. Nature's indications were then widely departed from in the exhibition of emetics. I have seen tart. emetic literally vomit a patient to death in this malignant variety of the epidemic. To give emetics in succession, without depletion by the lancet, was a practice so fraught with disastrous consequences, that I am greatly astonished how any mind furnished even with the rudiments of the science of medicine, could have fallen into a course of treatment so blind and fatal.

The application of cold water to the surface of the body, and the drinking of cold fluids, were eminently mischievous in the malignant form, more particularly in the intermittent type. When the patient was rather cold to the touch, or with irregular flushes of heat, though very hot to his own sensations, cold water applied to the skin was very injurious. But if the surface was absolutely cold and clammy, the

danger was greatly enhanced in using the ablutions or affusions: though such was the insupportable sense of cutaneous heat, that they would drench themselves with cold water, even against the express orders of the physician.

When they drank cold fluids, such as ice water or cold lemonade, besides the vomiting being brought on or aggravated, and the symptoms of gastric distress increased, the fluid sometimes ran through the bowels in a very rapid manner. Taking of ice water was very injurious, as it always aggravated the inflammatory action in the stomach and intestines.

I lost a lady whom I left pretty well in the morning, with no fever, who feeling thirsty upon the accession of slight fever in the afternoon, commenced eating ice, which brought on such extreme depression, and such gastric inflammation, as quickly destroyed her life.

This form of the epidemic was sometimes attended with a suppression of urine—it was always a bad sign, as it marked some nephritic paralysis.

In the generality of cases the urine was high coloured, and secreted in a small quantity.

Convalescence from all attacks were exceedingly slow. The state of the weather was very unfavourable, being close and sultry, though humid—this remark applies to the summer and fall of 1822 more appropriately.

After the above desultory remarks, I shall close this rather protracted paper by adverting to the use of mercury in the treatment of children, and mention some facts pertaining to the prophylactic measures, employed by some persons with success.

I condemn altogether any attempt to salivate children under twelve years of age, for the cure of fever, having seen excessively distressing and mortal effects follow, here, the use of mercury. Seven or eight cases of mortification of the cheeks, followed by death, occurred in this town and neighbourhood in the above years, from its excessive effects. Yet I used it freely as a purge, assisted by other cathartics, particularly castor oil, and with great advantage.

Blood-letting, liberally employed, with emetics of ipecac. mercurial cathartics, assisted by other more rapid purgative medicines, with blisters, were the measures depended on by me. I never saw any strong evidences of gastric inflammation in children under eight years, during the epidemic: the excitement was generally in the brain, though sometimes the bowels appeared to be the seat of great inflammation—as they were tense and tumefied, with much pain on pressure. From the difficulty accompanying venesection in children, I believe it is often neglected to the great detriment of life. It is an all important measure, and should be pushed to great extent in cerebral convulsions. I found the utmost benefit from it in the fever in children.

From what has been said, when treating of the subjects most liable to be attacked, it will be seen that the poorer class of Irish, who are too commonly much addicted to the use of spiritous liquors, must be most obnoxious to the fever. I believe, out of about two hundred and thirty patients who died in town, nearly one-fifth were of that class of people. There were several men of my acquaintance who habitually took grog pretty freely, who yet escaped the fever. But such lived in an easy, regular manner, and frequently took purgative medicines. One of them was bled several times during the epidemic. Almost every one who escaped an attack of the fever took aperient medicine, and lived regularly.

The sudden breaking up of an old habit, though that habit be injurious in its ultimate consequences, after the system has got accustomed to it, may be the exciting cause of fever. Persons who drank their grog and took no precautionary measures, were more liable to the fever than those unused to stimulating potations. Increasing the quantum of grog was increasing the liabilities to attack, and in a geometrical progression rendered the prospects of recovery, when attacked, more dubious and improbable.

We beg leave to invite the attention of our readers to the ensuing article. It was originally presented as an Inaugural Thesis—and though the production of a young man, is entitled to a respectful consideration, as well from the weight of his own character, as on account of the great opportunities of observation and experience which he commanded in the noble Infirmary of which he was a resident student. As far as our own testimony merits, it may be received in confirmation, to a very considerable extent, of the value of the Stethoscope, as a means of investigating the conditions of the lungs, in the several affections comprehended under the general denomination of Pulmonary Consumption.—Editor.

Art. II. *Remarks on the Stethoscope, in relation to Phthisis Pulmonalis.* By Edmund Strudwick, M. D. of North Carolina; late one of the Resident Students of the Philadelphia Alms House.

That there is great difficulty and obscurity attendant on the diagnosis of many diseases of the chest, is an observation of antiquity—the truth and accuracy of which, have been most clearly demonstrated by the experience of modern physicians.

The imperfect and deceptive nature of that knowledge derived from studying the general symptoms of pulmonic disease, compelled the older and later physicians to resort to auxiliary means, with the view to arrive at some certainty in the diagnosis of this important class of affections. To their ingenuity and observation we are indebted for the following, which were the only assisting methods known until the time of M. Laennec, who has made a valuable contribution in this way.

That of the Hippocratic *succussion*, which consists in violently shaking the patient, is of very ancient date, and bears the name of the author who introduced it to aid him in de-

tecting some morbid actions of the thoracic viscera. Its application, however, is not diversified—and from the rudeness of the operation, and the uncertainty of its results, it had entirely escaped the attention of enlightened physicians, at least those of the present day, until it was revived by M. Laennec, who is of opinion that its judicious employment may be advantageously resorted to, under some circumstances of pulmonary disease. In hydrothorax, and especially the obscure forms it occasionally puts on, I am disposed to believe that *succussion* will afford useful and discriminating indications.

Mensuration of the chest, which, when the depression of the shoulder is very obvious, and the inclination of the body considerable, affords a very marked sign of disease—but it is as M. Laennec has shown, more particularly illustrative of the consequences and terminations of chronic pleurisy, and offers a means of diagnosis, the employment of which is not susceptible of much variety, nor is it absolutely pathognomonic of any precise morbid condition.

Pectoral audition, by which is meant more strictly, immediate *auscultation*, although the term admits of greater latitude, relates to diseases of the heart—on which obscure and perplexing subject I forbear to embark, as it does not come within the limits of my paper.

Percussion of the chest, a more valuable diagnostic measure, has been known to the profession upwards of sixty years. It seems, however, not to have received that attention its importance demands.

Before Corvissart gave it his sanction and patronage it was much neglected, or only very partially practised. By Avenbrugger, its author, a work was published on the subject in the year 1761 at Vienna, which, though it was some time after translated at Montpellier, made no favourable impression. It seems, indeed, to have been overlooked both in private practice and in that of hospitals, until Corvissart translated the original work from the German, with many valuable additions, in which he clearly established its utility. Having been employed by Corvissart with signal

success during a long course of clinical instructions, it gained the confidence and regard of the profession, and was thus, by his perseverance and the influence of his name, brought into general use. *Percussion* may be had recourse to very advantageously, in discriminating many diseases to which the chest is exposed, while the general symptoms are so obscure as to furnish no correct conclusion, as in chronic pleurisy, pneumonia, &c. But in consumption, which is more properly connected with the object of the following pages, it is not attended with the same happy consequences, and in some conditions of this disease it is wholly inapplicable, or affords no indication elucidating its nature. There are strong objections constantly existing to its employment—the liver, the large end of the stomach when distended, the mammæ, all produce the dull flat sound denoting disease, when the parts are in a healthy state. Without attention to these circumstances we must be deceived—and independently of these, obesity, which is frequently met with in both sexes, renders it no longer a resource. The pain and inconvenience many experience during its operation, and its liability to excite a paroxysm of coughing, will often exclude it from genteel and private practice. Yet though these numerous causes operate against percussion, it is still not without use.

It would be easy to shew, were it deemed necessary to enter minutely into the consideration of the symptoms of phthisis, and to give to each one its due weight, their insufficiency to point out the seat and nature of the morbid action producing such symptoms—and that frequently unequivocal consumption may exist, without its being manifest by any of the phenomena that usually accompany the disease. This fact rests not solely on speculative views, but is supported by the experience of every one accustomed to *post mortem* examinations.

To Dr. Jackson, of this city, several cases have occurred where there was not a single sympton to produce the suspicion of pulmonary disease. Cough, pain, dyspnœa, &c. which designate phthisis pulmonalis, and its kindred affec-

tions, were entirely absent—some of these cases being considered as obscure intestinal disorders, and others entirely eluding successful investigation. Dissection, however, threw off the mask, and developed the true character of the disease, which was phthisis pulmonalis of the kind considered by Bayle as caused by miliary tubercles. I have also had an opportunity in the Alms-house infirmary, more than once, of observing the same thing. Of this character was the case of a boy who laboured under a lingering attack of pertussis, complicated with febrile action, slight pain in the breast, emaciation and a sallow complexion, which constituted the most prominent feature of the disease, leading to the conclusion that the irritation was located in the alimentary canal, and produced by worms. The treatment was directed accordingly, and the pulmonary symptoms being so slight, were considered of secondary importance. Dissection of the body revealed extensive ulceration of the lungs. Even purulent expectoration, in which more confidence has been reposed than in any other appearance, is by no means a correct criterion to determine whether the sputa has its origin from an ulcer in the lungs. It is now admitted, that whilst the matter thrown up exhibits unequivocal marks of pus, such expectoration may take place without any organic lesion in the structure of the lungs. The pus, however, will be modified by the particular tissue in which the action producing it is located. An inflammation of the mucous membrane of the bronchiæ, will establish an increased and peculiar secretory action of the vessels by which pus is evolved. We daily see a purulent secretion from the urethral surface which is sound and entire. The same thing is also observable in inflammations of the eye. "In peritoneal suppuration we have no ulceration or other breach of continuity in the membrane."

We are then warranted in the assertion that this symptom, usually looked upon as a formidable one, does not always, nor as often as is imagined, indicate the presence of consumption. M. Laennec, whose experience is ample, asserts, that in cases where an abscess exists and copious

purulent expectoration attends, the sputa is furnished in a larger quantity by the mucous membrane of the bronchiæ, than by the surface of the ulcer, which, however, he admits secretes pus, though not to a very great extent.

From the similarity of the principal symptoms of every pulmonary derangement, it is exceedingly embarrassing to assign to the various diseases phenomena sufficiently characteristic—and it is, as has been shewn, very often impracticable from their obscurity, to obtain any distinctive and satisfactory knowledge respecting them. Notwithstanding, therefore, the numerous means we have for detecting the pulmonic complaints, it is important to obtain others that will give greater accuracy to our discriminations, so as to be enabled to discover the insidious and disguised appearance they so often assume. Laying other considerations aside, it would be a painful reflection to every physician of correct feeling, to know that he had been entirely mistaken in his diagnosis—and perhaps additional mortification might be found in the recollection that his treatment had been erroneous, and tended to hasten the death of the patient. Hence it is equally advantageous to patient and practitioner, that we should entertain exact views of these diseases, and deduce our conclusions from principles in a great degree exempt from fallacy. This imperfection in our medical knowledge is to a certain extent remedied, by the introduction of an ingenious method for discovering the pectoral affections, which has been, within the few last years, presented to the notice of the profession with strong claims, meriting their serious attention.

The discoverer of this novel mode of diagnosis, is the indefatigable M. Laennec, of Paris. He deduces his indications by means of an instrument, which he has with much propriety denominated *Stethoscope.* It is derived from two Greek words—*stethos*, signifying the chest, and *skopeo*, to examine. The appellation of *Pectoriloque* is also applicable to it, and comes from the Latin words, *pectus*, the breast, and *loquor* to speak. The former term is, however, better adapted to its designation, inasmuch as it is expressive of

a more extensive and diversified application—whereas *Pectoriloque*, which takes its name from a single phenomenon called pectriloquism, rendered sensible to the ear by the employment of this instrument, only denotes a limited use of it.

This instrument is cylindrical, and composed of wood of a light, loose texture, which M. Laennec thinks conveys sound more clearly than that which is hard and dense. It is twelve inches in length, and four and a half in circumference, perforated by a central circular canal five lines in diameter. At its lower or pectoral end there is a funnel-like excavation, which can be filled up when required, by a plug exactly adapted to it, having a continuation of calibre by means of a brass tube, which passes through the plug or stopple, and penetrates some distance into the perforation of the stethoscope, retaining with firmness this detached portion in its situation.

The intelligence from the employment of the stethoscope, is derived from three sources—the respiration, the voice, and the circulation. By the correct application of one end of it to the thorax, and the nice adaptation of the upper or auricular extremity to the ear, so that its canal will be opposite to the meatus, the vibration of peculiar sounds characteristic of certain morbid conditions of the lungs, are rendered distinctly audible.

When the chest is explored with the view to attend to the respiration, the stopple must be removed—if in this state of the stethoscope a patient speaks, the excavation at the end of it will yield pectriloquism more or less distinct. The stopple, therefore, is to be replaced when the voice or the circulation is the objects of our research—the latter, as I have before remarked, is foreign to my purpose.

M. Laennec affirms that the stethoscope is competent to the detection of many disorders of the chest, and that frequently, it not only points out the seat and condition of the disease, but suggests the proper treatment, which must have been overlooked, or if adopted, be altogether the result of chance.

It is not my intention to vindicate or examine all that has been alleged in favour of this new agent by its author. The accomplishment of a task so difficult and comprehensive, requires more time, talent, and experience than I possess. In the present investigation I shall confine myself to those points that admit of demonstration, by a series of observations founded on dissection, testing the truth of the indications obtained from the stethoscope, and nothing, or very little will be advanced on speculative grounds.

The application of the stethoscope has been an object of ridicule even in the place of its invention, but there are not wanting others to advocate its utility, of an elevated rank in the profession, and whose experience and observation enable them to form an accurate and impartial estimate. The stethoscope, as regards many of its indications, receives no slender support from Dr. Jackson, to whom I have before alluded, one of our most zealous and distinguished practitioners. He has had ample opportunity to decide on its value, both as physician to the Alms House, and from having used it in his private practice. His confidence, however, in it, is not so great as to embrace without a wholesome scepticism, every advantage claimed for it by the author, who from a very natural fondness for his invention, bestows on it much unmerited praise. The undoubted utility of the stethoscope should not induce an exaggeration of its importance, and M. Laennec with all his partiality, does not confide in the cylinder, to the exclusion of general symptoms, and other diagnostic sources. The stethoscope is not intended to supplant the study of symptomatology, nor the employment of percussion and other useful methods, but they should be studied and practised in combination, and cannot fail to give to our conclusions a degree of accuracy hitherto unattainable.

The intimations of disease that we receive by M. Laennec's mode of investigation, arise immediately from the morbid lesion, and not from external signs, whose connexion are remote from the local injury, and which are not unfrequently complicated with those of other diseases of a cha-

racter totally different. We consider the stethoscope in no other light than an important and excellent auxiliary means of diagnosis, and our entire confidence should be withheld until experiment and observation have confirmed its utility. But we condemn that opposition which is the offspring of arrogance or ignorance—facts should constitute the basis of every denial in regard to its usefulness, as of every other improvement in medicine.

Auscultation, performed by the stethoscope and the immediate application of the ear, is attended with similar advantages, except that the latter mode is less convenient and frequently prohibited from a sense of delicacy, which forms no objection to the use of mediate auscultation. But M. Fodera gives a decided preference to immediate auscultation, by which he thinks, that we can detect diseases eluding the observation of the stethoscope. Be this, however, as it may, it is unimportant as regards the diagnostic utility of auscultation applied to the pulmonary affections.

I regret that my experience is so narrow and imperfect in pneumonia, pleurisy, bronchitis, &c. especially the chronic form of these diseases, in which the stethoscope promises to display its most useful powers. These diseases are highly dangerous, and sometimes assume a deceptive aspect that no exterior symptom can expose. Hence the means that will detect them under such circumstances, are indispensably necessary.

From what I have seen in these cases, I am inclined to believe that the skilful employment of the stethoscope will be found adequate to the complete discovery of the insidious and chronic shapes these diseases frequently wear, and thus confer service on mankind, and reflect credit on our profession.*

* The stethoscope, according to M. Kergaradec, promises to afford the most certain resource in doubtful cases of the life or death of the child in utero. This acquisition to obstetrical knowledge is very desirable, from the equivocal nature of nearly all the symptoms denoting the occurrence of the latter event. Although it is not properly connected with the subject under consideration, I may remark, that by way of experiment, I ex-

Next I am to give some account of pectriloquism, and of the condition of the lungs which produces this phenomenon, and also of what is denoted by the absence of respiration in any portion of the lungs.

When the lungs are ulcerated to any extent, the bronchiæ communicate with the abscess, and on applying the stethoscope over this situation, and directing the patient to speak with his head turned aside, the sound of the voice arrives at the ulcerous excavation, and vibrating through it, seems to arise immediately from the breast, and traversing the stethoscope, impinges on the ear with a force and distinctness, which conveys the idea that the patient spoke to us through the instrument. It is this circumstance which constitutes what is termed pectriloquism.

When respiration is healthy, it communicates to the ear

plored the abdomen of a pregnant woman, in labour, with the stethoscope, and by the direct application of the ear. The result of this examination, conducted from the anterior part of the abdomen, was that slow, very indistinct, and deep pulsation was discovered, and attributed to the circulation of the mother. The action of the fœtal heart, which is quick, frequent and active, was on this occasion inaudible, indicating the child's death. Delivery presented a still-born child. To become convinced of the nature and accuracy of the above examination, it was with great care repeated on a healthy pregnant woman about eight months gone, in the presence of my friend Mr. Charles Randolph, a resident student of the Alms House. We were both able satisfactorily to recognise the quick contractions of the fœtal heart by immediate auscultation, yet through the medium of the stethoscope, they were scarcely evident, which lends some support to M. Fodera's position. In this case the maternal circulation was not heard by auscultation, performed from the anterior parietes of the abdomen, as the comparative superficial situation of the child's heart rendered its rapid pulsations so obvious, that those of the mother were either destroyed or not perceptible—but from the spine or posterior part of the abdomen, they were quite distinct, and characterized by a slow voluminous action.

The termination of the present case, will not induce me to adopt any very sanguine or extravagant conclusion—although I think the highly favourable and striking result, is sufficient to press it strongly on the attention of practitioners of midwifery, as at least an important and valuable diagnostic, in those doubtful and perplexing cases, which not unfrequently occur.

by the stethoscope a gentle equable murmur, which resembles in some measure the rippling of a small stream.

By adhesion of the structure of the lungs and congestion, they become no longer permeable to the air, and consequently the murmur of respiration is not to be heard. Though air be received into the lungs, when water and air are interposed between their surface and the parietes of the thorax, the respiratory murmur is absent—sometimes, however, it is indistinctly heard in mild cases of hydrothorax.

Congestion and permanent induration are easily distinguished by the progress and history of the case—and to ascertain whether the respiration is inaudible from the presence of a watery or an aeriform fluid in the cavity of the chest, we must attend to the combined results yielded by percussion and the employment of the stethoscope. If one side of the chest be more sonorous than the other, (as the presence of air will render it) or more so than in a natural state, and the respiration is not to be heard on this side, while it is distinct on the other, where the sound elicited by percussion is less sonorous, we may be assured that air is contained in the cavity of the thorax, and is the cause of the cessation of respiration. When the respiratory murmur is wanting, from water in the chest, the stethoscope and percussion give results similar to those in common induration. In both, percussion yields the dull flat sound, and the murmur of respiration is entirely destroyed—the difference, however, can be known from attention to the general symptoms, and sometimes mediate auscultation gives rise to a fluctuating murmur.

In making examinations with the stethoscope, we should not be too hasty in our decisions, for a considerable excavation may exist in the lungs, and be completely filled with pus. Under such circumstances, pectriloquism will not be produced. Yet immediately after a paroxysm of coughing, which evacuates the purulent contents of the ulcer, and admits the voice into its cavity, we shall have evident pectriloquism.

During an examination, silence should prevail in the pa-

tient's apartment, as the slightest noise will destroy or modify the indication, and lead us to adopt an erroneous conclusion. Where emaciation exists to any extent, a pledget of linen should be inserted between the end of the stethoscope and the chest, to ensure its correct application. Without attention to this circumstance, it must prove a source of deception.

The interposition of thick articles of clothing will not alter or lessen the sound of respiration. But care should be taken to prevent clothing from rubbing against the stethoscope, as this will produce a sound very analogous to some we hear through the instrument.

To illustrate the preceding observations I shall cite the the following cases, in which the condition of the lungs, as represented by the stethoscope, was carefully noted down at the time of examination, and compared with the appearances on dissection.

Case 1.—Hannah Nelson, aged thirty-six years, was admitted into the Alms House in January last, labouring under an attack of bronchitis, which had, from inattention and improper management, assumed the chronic form. In the course of six or eight weeks, the symptoms of phthisis pulmonalis succeeded. The patient was troubled with a shrill wheezing cough, occasionally pain of the chest, slight dyspnœa, quick irritated pulse, and copious night sweats. The sputa, which was moderate in quantity, resembled pus and mucus mixed. There was a temporary mitigation of these symptoms, apparently indicating recovery, but they soon returned much aggravated, together with hectic fever, colliquative diarrhœa and emaciation, eventuating ultimately in death—previously, however, to which, repeated examinations with the stethoscope, gave the following result.

Pectriloquism existed in the posterior portion of the upper lobe of the left lung, and was also evident in its middle lobe—in the lower portion of this lung, respiration was almost natural. Pectriloquism was very perceptible in the superior lobe of the right lung, while the respiratory murmur could not be distinguished in its inferior portion.

Appearance on dissection.—A considerable abscess was found in the upper portion of the left lung—also one of less size in the middle portion of the same side, corresponding to the points at which pectriloquism was evident—all that portion of the lung surrounding the ulcers was indurated—the inferior lobe was exempt from disease.

In the upper lobe of the right lung an extensive abscess existed, with induration of its lower lobe, beset with tubercles somewhat advanced, or abscesses in miniature, filled with purulent matter.

Case 2.—Harriet Church, aged twenty-two years, was admitted into the Alms House on the 19th of June last—she had been for the two or three last years subject to cough, and pain in the breast, which were much increased by the slightest exposure. Dr. Jackson, the physician in attendance, pronounced the case to be phthisis pulmonalis, arising from frequent and neglected catarrhal affections. The patient laboured under quick and hurried respiration, which, on the most moderate exercise, was so much increased and performed with such difficulty, that farther exertion or even walking was impracticable. Copious purulent expectoration existed, which towards the decline of the disease was much diminished—the cough slight, occasional pain of either side, which was aggravated by cough and a deep inspiration—the pulse was quick and frequent—appetite variable. These symptoms were so much relieved at one time, that the patient confidently expected to recover.

At this period her general appearance was very good, and her health much improved—with the exception of some slight derangement in the function of respiration. By the knowledge obtained through the medium of the stethoscope, disease was not indicated—on the contrary, we would have been led to the conclusion, that the patient was in a state of rapid convalescence. In fact, she requested her discharge from the Institution, saying, that her health was sufficiently restored to pursue with perfect facility her usual avocations.

But before a great while emaciation succeeded, attended

with hectic fever, night sweats, and augmented difficulty of breathing—and in consequence of a removal from the Institution, her death was hastened, which took place on the 25th of July.

By an examination with the stethoscope, pectriloquism was evident in the upper lobe of each lung—respiration in the inferior lobe of the right lung was quite audible, and almost natural. All that portion of the left lung inferior to the abscess, gave no murmur of respiration, and percussion elicited a dull sound, shewing conclusively that complete and extensive induration existed. This indication was obtained by the absence of the murmur of respiration on applying the stethoscope both anteriorly and posteriorly to the chest. On a subsequent examination the ulcer of the left lung had made considerable progress, and pectriloquism, clearly and to perfect conviction, existed over a large extent of the chest. All that portion extending from the clavicle down to the fourth rib, and from the sternum to the edge of the latissimus dorsi, was pectriloquous, denoting an extensive ulcerous excavation.

Appearance on dissection.—An abscess of some size was found in the superior lobe of the right lung, surrounded with induration. The inferior portion of this lung was exempt from disease, with the exception of a few small tubercles in their incipient state, and the union of these lobes. In the superior of the left lung an immense ulcer was found, which might contain sixteen or eighteen ounces of fluid, occupying the whole of this upper lobe—the inferior portion of this lung was one mass of adhesion, and unfit for the purpose of respiration.

Case 3.—Anna Beck, during the winter of 1821, was attacked with a severe catarrh, attended with hoarseness. The catarrhal affection yielded, but the hoarseness remained, and assumed the form of permanent aphonia, complicated with a troublesome cough, which continued the ensuing summer. In this condition she was admitted into the Alms House in March 1823. Her chest was explored by the stethoscope soon after her admission—and induration of the

inferior lobe of the right lung was detected: percussion in the clearest manner confirmed this indication. In time the usual symptoms of consumption were developed, and at length pectriloquism became discoverable in the superior lobe of the same lung, by frequent subsequent examinations.

The middle portion of the left lung gave rise to imperfect pectriloquism: respiration above this point was somewhat obstructed, and in the inferior lobe the respiratory murmur was distinctly audible. The patient died of the disease on the 31st of August.

Appearance on dissection.—Complete adhesion had taken place between the lobes of the right lung, and it was converted into one compact mass. An extensive ulcerous cavity occupied the superior portion of this lung, with the inferior lobe in a state of induration. The lowest part of the superior lobe of the left lung contained a small open vomica—a few small hard tubercles were found in this portion, and the inferior lobe was comparatively free from disease.

The liver was much altered in appearance and somewhat in structure—its size considerably increased, so that a portion of it occupied all that space between the surface of this lung, and the parietes of the thorax, almost as high up as the abscess itself. This position of the liver, provided the lung had been healthy, would have afforded signs of disease, both by the stethoscope and percussion. Yet the circumstance of the upper portion of the lung preserving a state of health, and attention to the general symptoms, might have prevented error in our conclusions.

These cases are adduced, not with the design to explain or determine the obscure pathology of consumption, but solely with the view to give some feeble corroboration to the truth of a few indications deduced from the stethoscope.

It would be needless to illustrate and prove the same points by a multiplication of cases, though, were it otherwise, I could enumerate many others perfectly similar which came within my own actual observation. I will, however, adduce the following case, which occurred to Dr. Jackson,

by whose kindness and liberality I am furnished with it, as a striking example of the accuracy with which the stethoscope presents its indications.

Case 4.—John Sterret, aged fifty-four years, was admitted into the Alms House, September 15th. He complained of great difficulty of breathing, which was increased by a recumbent posture--his cough was frequent and troublesome, with but little expectoration. The right side of the thorax returned, on percussion, a dull, flat sound—the left side was sonorous. Examined with the stethoscope, the murmur of respiration was quite inaudible on the right side, and perfectly natural on the left—at the same time the sound of the fluctuation of a fluid, was to be discovered by the stethoscope in the right cavity of the thorax. From this examination the disease was pronounced to be hydrothorax in the right side of the chest. Death ensued suddenly on the 11th of October. The body was examined the next day. When the thorax was opened, the right cavity was found filled with a serous fluid—more than a gallon was taken out and some escaped. The right lung was compressed into a volume rather less than one-fourth of its original size, and was perfectly solid, without a vestige of cellular structure remaining. The pleura of this cavity, costalis and pulmonalis, was highly inflamed—its vessels were so much injected as to give an uniform tinge of red to the whole membrane, which was thickened and rough, presenting a granulated appearance. The pleura and lung of the left cavity were entirely sound, and contained no water.

Never, in a single instance, have the indications of the stethoscope been falsified by the observations and dissections made at the Alms House, at least those with which I am acquainted, and more particularly when ulceration and induration have been represented.

I consider unequivocal pectriloquism as a pathognomonic symptom of phthisis pulmonalis, and in no instance, as far as my limited experience goes, have I known a complete recovery to take place where its existence had been clear and indisputable. Yet it is reasonable to believe that a simple

ulceration of the lungs, unconnected with a constitutional predisposition, or a strumous diathesis, would heal as readily as an ulcer in any other situation, with the exception of the continual movement of these organs. All pectriloquous persons, however, who have been the subject of my observation, whether the pectoral affection was hereditary, or produced by other causes, have alike become victims to this devastating malady, which continues "the scourge of mankind and the reproach of our art."

Admitting that we can, from pectriloquism, detect with satisfactory precision an ulcer in the lungs, still an important question presents itself: Does consumption, in consequence, become a more manageable disease?—or, on the contrary, is it not a painful confirmation of the fact, that this afflicting disorder will proceed with an obstinacy not to be resisted by any of our remedial agents?

In the present state of our knowledge it may be said, that in this particular state of phthisis, the diagnostic accuracy of the stethoscope is rather a source of gratification to the practitioner, than of real utility to the patient. It elucidates his dubious and often fallacious diagnosis from symptoms: though after establishing the true and precise condition of the morbid action, so desirable in every case, it points out no remedy for its removal—the ultimate and important design of all investigations. Yet, because the stethoscope, in this respect, fails in a disease which has long baffled the skill and best directed efforts of physicians, and which, even in the present improved state of medicine, places our inability in a conspicuous light, we should not reject it, and condemn a species of knowledge which is always acceptable. It is only thus by unfolding the nature of disease that its treatment can be conducted on scientific principles, and our profession receive permanent improvement.

The mucous, or guggling rattle, is considered by M. Laennec to afford signs almost as distinctive of consumption as pectriloquism. It may, however, arise from morbid conditions widely different, and presents very dissimilar indications. In one instance it is produced "by the trans-

mission of air through softened tuberculous matter," and in the other arises from the passage of air through the minuter bronchial ramifications, which contain a secreted matter, either from their own surface, the result of inflammation, or that originating from a maturated tubercle, by the process of expectoration occupies the bronchiæ. When air passes through an accumulation of sputa in the trachea, and large portions of the bronchiæ, it is in popular language denominated the rattles, which is very discoverable by immediate auscultation, even at some distance.

It is exceedingly difficult to determine whether the air passes through the matter of small tuberculous excavations, or that secreted and contained in the slender bronchial terminations. The mode of distinction is incomplete, and somewhat deceptive. The existence of maturated tubercles is indicated, when the phenomena of this species of guggle is local and confined to circumscribed portions of the chest—yet it is clear that a local secretion of the bronchiæ, or a slight general effusion of the bronchial membrane, by gravity seeking the depending bronchial portions, will give rise to this rattle locally. This would shew tubercles in a state of maturation, when in fact nothing but a limited or inconsiderable inflammation of the mucous membrane of the bronchiæ exists. The tuberculous matter also, after it is thrown into the bronchiæ, will produce this rattle generally, and prove a source of error. Notwithstanding these causes of deception, this indication may occasionally be useful, when considered in conjunction with exterior symptoms.

A very fruitful source of consumption, independent of hereditary predisposition, is to be found in the terminations of pneumonia, pleurisy, &c. An attack of pneumonic inflammation when severe, in which the lancet has been sparingly used, or owing to some other improper management of the case, terminates frequently, and especially in that portion of the lungs which sustained the force and activity of the disease, by effusion of matter or the formation of strong adhesions, constituting induration. This portion of the lung is then rendered impermeable to the air, and consequently

unfit for the purpose of respiration. The indurated part no longer aiding in the performance of a salutary and important office, becomes useless, and in fact foreign to the animal economy—and the absorbents, with the view to relieve the system of every thing redundant and injurious, establish the process of ulceration, to which succeeds the long and frightful train of symptoms of phthisis pulmonalis. In other instances, the consolidated mass is disposed to take on a slow chronic inflammation which excites ulceration. "The hepatised induration appears to be highly susceptible of inflammatory action, and under the influence of it seems to run into extensive ulceration of a peculiarly unhealthy kind."

I do not pretend to say that every case of induration produces ulceration. On the contrary, it will exist for a considerable time, and in some rare cases, even for life without any serious detriment: yet this exception is not so frequent in its occurrence, as to militate against the belief that it often terminates in ulceration and suppuration.

Induration of any portion of the lung, taking place where there is a predisposition to consumption, will undoubtedly prove an exciting cause of this disease.

By resorting to the stethoscope on the decline of an attack of pneumonia, particularly when conjoined with percussion, we detect with the utmost accuracy the presence of induration, so frequently consequent on inflammation of the lungs, and almost immediately too after its formation, when there is a greater probability of relieving the engorgement. This is to be attempted by local, and if necessary, general depletion. An adherence to the antiphlogistic plan, rigidly enjoined, constitutes an important part of the treatment. Contrary to a very prevalent practice, Dr. Jackson adopted in the Alms House, the mode of treating his consumptive patients with a low diet,proscribing the stimulant and tonic plan altogether—and I can confidently assert, from seeing the practice fairly tried, that it was productive of more relief and comfort than the opposite course. Though it did not effect a cure, it conducted these unfortunate per-

sons to their approaching and inevitable end, comparatively with exemption from the pain and suffering incident to the disease. Exterior irritation by issues, and the repeated application of blisters, must not be overlooked. On this *expectant* method of management, a very rational hope of success may be founded, especially in recent cases. As a preventive of consumption, its superiority in a large majority of cases is indisputable. Notwithstanding what has been alleged to the contrary, I am persuaded that by the adoption of a restricted course of treatment, enforcing on the patient the absolute necessity of prudent and abstemious habits, his life may be protracted, even if the disease be not arrested. But regardless of these cautions, and adopting a liberal indulgence in the luxuries of the table, there is reason to believe that the most fatal effects will be induced.

If, then, the indications of the stethoscope suggest the means to ward off an attack of consumption, who will deny that it is not an important accession to medicine? To bestow vaguely the epithet of phthisis pulmonalis on almost every chronic affection of the breast, is at present a very prevalent professional error, which the stethoscope is eminently calculated to correct. It is unnecessary to animadvert on the pernicious tendency of this want of proper discrimination. Evidently it paralyzes our efforts, and limits research in diseases, already too much involved in obscurity. To pronounce an accurate decision on an existing disease, its extent and nature, is not more useful to the physician, in a therapeutic point of view, than it is sometimes consoling and important to the patient.

It was proposed some years ago, for the cure of consumption, to puncture the thorax, and by the admission of air into its cavity, inducing in the lungs a state of collapse, to promote the healing of an ulcer.

A great obstacle to this practice, was undoubtedly the uncertainty of all the means to determine unequivocally the existence of ulceration in these organs.

It might now very plausiby be anticipated, from the infallibility with which the stethoscope discovers this morbid

condition, that we might adopt the practice with very flattering prospects of success. But when we recollect the fact, that in nine cases out of ten, induration is present with ulceration, and that frequently ulcers in the lungs are either surrounded or attended with extensive and permanent adhesion of their structure, which must effectually prevent the sides of the ulcer from coming in contact, as well as render the indurated portion incapable of collapse—it becomes apparent, that all that could be obtained from the operation is relief from motion, which surely cannot rectify that vitiated state of the lungs productive of consumption.

The prompt union of an incision or other wound in the lungs, is no proof, as has been alleged, that the operation alluded to will effect the end for which it is designed.

Even granting that a state of collapse might accomplish its alleged purpose, it remains to be proved that it would reinstate the indurated part of the lung to the performance of its function, which, were it to happen on the restoration of motion, would excite the ulcerative action, not to mention that the lungs after the cure of the ulcer would retain their same tendency to a return of the disease. Where ulceration is the effect of hereditary consumption, or that arising from a scrofulous condition, no one will affirm that the operation can succeed in curing this form of pulmonary disease.

Can the tendency or kind of morbid action existing, I repeat, be arrested and corrected merely by a partial suspension of the function of respiration? What reason, moreover, is there for supposing, that a quiescent state of the lungs should effect such an important and wonderful alteration?

These considerations, in my opinion, impose an almost insuperable barrier to the introduction of this new and ingenious expedient.*

* I have lately been informed by Dr. Chapman, that twelve or fourteen years since, Dr. Physick in a consultation with him, proposed, for the treatment of a consumptive case, this very expedient. This was a bare

ART. III. *An account of the Fever which prevailed in the American Squadron, and at Thompson's Island,* 1823. By M. MORGAN, M. D.

THE name of Thompson's Island has been recently given to one of the largest of the many small islands on the coast of Florida, which is known on the Spanish charts as Cayo Hueso, (Bone Key) and on the English as Key West.

Its extent is about seven miles from east to west, and its greatest breadth two—being distant from the main land of Florida upwards of forty miles, and more than eighty from Havana.

The latitude of the south-west point, from which the

suggestion on the part of Professor Physick, and as a fact I register it. Notwithstanding the high authority from which it proceeds, I can but believe for reasons assigned, that its practical application will not realize the expectations it has excited. However, should it be found adapted to some forms of pulmonary consumption, it will afford another conspicuous instance of the utility conferred on medicine, by the reflections of his great and inventive mind, from whose ample resources our science has been enriched with many splendid and valuable improvements.

Dr. Carson of Liverpool, while investigating the causes of the vacuity of the arteries after death, inferred from some of his experiments, that a perfect collapse can be induced, by admitting air into the chest, through an aperture in its parietes. It also occurred to him, that this fact might be advantageously applied to the treatment of consumption, and in a single case he has reduced this suggestion to actual practice, with what success I am unable to say. It is, however, exceedingly difficult to conceive at what particular stage of phthisis the operation would be applicable, or under what precise circumstances it is demanded.

Dr. Williams, also of Liverpool, performed a set of experiments to determine the practicability of this operation, and their results are at variance with those conducted by Dr. Carson. The former gentleman comes to the conclusion, that the office of one lung cannot be suspended, while the auxiliary respiratory powers remain unrestrained, and the opposite one continues in the unimpaired exercise of its function. This inference, if it be correct, will exclude and condemn the operation to which we have alluded.

most correct observations were made, is 24° 33′ north—longitude 82° 02′ west.

The Island appears to be made up of coral concretions, shells, and stones of carbonate of lime, with a covering of vegetable mould, which lie on a substratum of the extensive calcarious reef found on this part of the coast, and which extend to various depths, according to the irregularities of the base.

The most elevated parts are not more than ten feet above the level of the sea. The surface has many inequalities, forming basins in which the water lies after the rainy season, and several of these ponds do not entirely dry up until they are again replenished from their annual source. All the water on the Island contains a good deal of salt in solution, and during the season of greatest drought, becomes considerably brackish. By digging fifteen or twenty feet water may be obtained, but it is of inferior quality to that in the standing pools—all of which was potable, but by no means palatable. The Island is covered with a thick growth of small trees and bushes of various kinds, and a few deer and other animals were found on it. A narrow strip of the southern border is covered with grass, and about eight acres of the west end have been cleared by the proprietors, and cultivated with corn, (maize) and various vegetables. Off this end and immediately to leeward, is the harbour, and near it was a pond of water, from which a drain was cut to the sea: towards August its superficies was very much diminished by draining and evaporation, leaving a surface of mud exposed to the sun.

There are regular tides, but somewhat influenced by the strength and direction of the winds. The prevailing winds are from the east, northward and eastward, and southward and eastward, driving a great quantity of gulf weed on shore on the south side of the Island.

On the border of the pond before mentioned was a mound a little elevated from the surrounding soil, which excited the curiosity of the officers, and on examination it was found to contain many human bones, of both sexes and various

ages. Some pieces of Spanish coin, and a female portrait in miniature were also dug up, and it appeared probable that some little colony had taken up their abode there, with a view of fishing, or as a refuge from pestilence in the neighbouring settlements.

The government of the United States having determined to occupy the Island, for the convenience of the squadron employed in the suppression of piracy in the West Indies, Commodore Porter sailed from Norfolk on the 14th February, touched at St. Thomas on the 3d March, and cruising down Porto Rico, St. Domingo, and Cuba, a part of the squadron arrived at the Island on the 3d April, and the remainder within two weeks afterwards. The Commodore gave to the harbour the name of Port Rogers, and to the place where the houses were to be erected, Allenton.

About a hundred and fifty mechanics, labourers and marines, were detailed for building houses and performing other necessary duty on shore, and the rest of the crews were actively employed in cruising along the coast of Cuba.

Situated so near the tropic, and possessing all the phenomena usually connected with the prevalence of yellow fever, it was apprehended by the medical officers who had any experience on the West India station, that as summer advanced the Island would become sickly, as all the persons there were from a northern climate. Only a few sporadic cases of fever, however, occurred before August.

During April and the greater part of May, only a few light showers of rain fell—but towards the last of May the rains commenced and continued for several weeks. Previous to this, the grass was all killed and dried up with the sun. In these months the mean temperature at meridian was 84° Farenheit—the range of the thermometer, 75° to 90° at meridian: in June from 82°—90°: July 82°—94°: August and September 85°—97°. In the two latter months it was seldom lower than 90° at meridian.

The first case of yellow fever that occurred in any part of the squadron, was in the Peacock while lying at Vera Cruz. A young officer of full habit, and little accustomed

to the climate, who had exposed himself much to the sun on the Mole while watering, had a violent attack, and died with black vomit on the 9th June, after an illness of six days. No other case occurred at this time in the ship. The city was not very sickly, but the people of Mexico and the high table lands in the interior, were not without apprehensions, and approached it with caution.

The next cases of malignant fever that happened in the squadron, were in the store ship Decoy. This vessel was despatched to Havana for water and stores, and was detained in that port for upwards of a week. On her return to the Island, several died on board of yellow fever. This was towards the last of June. Soon afterwards the same ship was sent to the Chesapcake, to return immediately with stores. Several officers went home in her as passengers, who had been living four or five weeks before on the Island. They sickened on the passage and died, as did several of the crew, some having black vomit.

The disease in this ship was, I think, erroneously attributed to some ballast taken in at the Island. I say erroneously, because the fever was in the ship before the ballast, and the same kind of materials were on the Island exposed to the sun, when all other things existed, supposed to have an agency in occasioning the fever, but no case appeared for six weeks afterwards. It seems more probable that the true cause was either the previous filthy state of the vessel, into which no water was allowed to be admitted, except by leakage, or that they carried the atmosphere of Havana with them for some time before the ship could be completely ventilated. When we reflect on the great depth of a large ship's hold, and the very imperfect means of ventilation at present possessed, the latter position does not seem altogether without support.

My inquiries on this subject have been attended with a conviction, that filth in ships is much more rarely the cause of yellow fever than has been generally supposed, and it is very seldom we find a ship with the yellow fever on board,

if kept cruising, it being always the result of remaining in port.

About the 1st of August, the English gun brig Bustard came over to the Island from Havana in distress, most of the crew being sick. They were two months from Kingston, (Jamaica) had been cruising on the north side of Cuba, had no sick when they went into Havana, and remained there ten days. They came to anchor at the distance of about a mile from the Island, where they constantly had the benefit of the trade wind, were supplied with such refreshments as the place afforded, and in two weeks they were all convalescent and able to proceed to Kingston. Between forty and fifty of the officers and crew had the fever, but many of them mildly—only ten or twelve of them died.

From the 15th to the 20th of August, some cases appeared on the Island, the weather having been unusually hot, and after the 20th it raged with merciless violence, until the middle of September, when the ships were ordered to Norfolk, and there were only about a dozen persons left behind who had not been sick. Some slaves from Charleston I believe all escaped.

On the 20th of August, the John Adams arrived last from Havana, where they had remained only three or four days, and had no sick on board of fever, when they went in. When they came to the Island, several cases of yellow fever were on board, and they lost in a few days ten or twelve of the officers and crew. In three weeks the ship was nearly healthy.

From the 20th of August, numbers were daily taken, and it was recommended to abandon the point at Allenton, as that appeared to be the most probable location of the source of the malaria, and this was immediately done, so far as it was then practicable.

From the general similarity of diet, habits, and predisposition among sailors and marines, a corresponding uniformity of symptoms was to be expected: some diversity existed, but only such as would happen in different constitutions, when exposed for a longer or shorter time to the

causes of the fever. As they had lived on ship's rations, without any additional vegetable food, and had no fresh provisions, except the few fish they caught, the system when attacked did not manifest much tenaciousness of life, but sunk without resistance under the violent grasp of the disease. The worst cases of yellow fever are not as some writers have said, those in which there is most reaction—these, by copious depletion in the early stage, are often the most manageable. But where there is less vascular excitement, much torpor, mental and physical, except of the stomach, and that excessively irritable, and the patient seems in most respects as if he had taken poison, there is less hope of a a favourable issue.

Symptoms.—It is only necessary to give a few of the more prominent symptoms of the disease, as they are enumerated in every treatise and familiar to every reader of medical works. The sick were mostly attacked suddenly with pain in the head and back, but in some of the most violent and fatal cases, little or no pain was complained of.

The pulse was various, accordingly as there was more or less excitability in the circulatory system. In some it was slower than natural at a pretty early stage of the disease. It differed likewise as to force—some having a full, strong pulse, others a weak and easily compressible one. There was great heat of the skin, especially about the body, neck and head. The conjunctiva of the eye was red, and its vessels turgid. The tongue had fiery red papillæ on its edges, and was covered with a white tenacious slime, which soon became a whitish fur. The tongue, fauces and lips were of a dark red, resembling the colour of an old brick. The stomach was often in that state of irritability so distressing to the patient and his attendants, when nothing can be for a moment retained. Those of bad constitutions and intemperate habits, often died on the third day. When the fever was protracted beyond the fifth day, the hemorrhagic state commenced. Those who had just come to the station, and who had been accustomed to a wholesome nourishing diet, had more reaction, and less of the redness of the mouth and

tongue. Deafness was a common symptom, and a very unfavourable one, in the early stage. I saw none recover after it. Some patients lived until the tenth or twelfth day, and afterwards sunk, the stomach having suffered irremediable injury, and probably existing in a state of ulceration. A very red, clean tongue, with a smooth surface in the middle about the fourth or fifth day, was a bad symptom—I saw several die who had before no other apparent bad omen.

Treatment.—I might have premised in the first page that it is more in compliance with professional duty, than with an expectation of giving any thing new on the subject, that I have presented this imperfect sketch to the medical public.

I only claim the merit for myself and associates of having faithfully attempted an application of the various remedies heretofore used, believing that unsuccessful as our practice was, we are yet as much in want of a judicious employment of our present means as we are of new remedies. Certainly no situation in which a physician can be placed, requires a more frequent recollection of Dr. Gregory's definition of empiricism, than when treating yellow fever—and to avoid applying a remedy to every case from observing its effects in one instance, constitutes no small part of the duty of a practitioner. A proneness to an opposite course, and to ascribing effects to medicines, without reference to the sanity of the vital powers, together with an unreflecting faith in confident and premature declarations concerning the efficacy of medicines, continues to be the most fruitful sources of erroneous practical doctrines.

We are indebted to some illustrious men in our own country for correct views of the pathology of yellow fever, particularly to Dr. Physick and Dr. Parrish, and all the labours of the last twenty years have added little to their previous contributions. The disease has long been known to consist of an inflammation of a peculiar kind in the duodenum and stomach, to arrest which we have not, and probably never shall have, any specific. All the exterior phenomena apparent to our senses are only concomitants of this great morbid action within. Being therefore seated in, and

having complete possession of, the very medium through which most of our remedies operate, seizing for its location the very citadel of vitality, is it surprising that it continues to be one of the most fatal on the list of human maladies?

The disease was treated by blood-letting, emeto-cathartics, cathartics, cold water, blisters, mercury, enemata, warm bath, diaphoretics and tonics.

Bleeding seemed required in a good many patients, chiefly officers, who had been accustomed to a more nourishing diet than the seamen, and who were not exhausted with laborious exertion. Five officers who came under my care in the first stage of the fever, are living witnesses of its salutary effect, and from the quantity of blood abstracted, and subsequent relief, little doubt could exist of its propriety in these cases, I may say of its indispensable utility. In some instances, where the reaction was violent, prompt depletion put the patient out of danger long before the time that a crisis would have arrived from its regular progress.

Sometimes venesection was commenced with. But where doubts existed of its necessity, the stomach and bowels were first evacuated. It was seldom proper after the first twelve hours.

In many cases blood-letting was totally inadmissible, only increasing the torpor and prostration already too great. When properly applied it relieved pain, diminished vascular action, prevented delirium, and facilitated the operation of cathartics. The blood after standing, mostly exhibited a coagulum with a bright red surface.

From the nature and quality of the food consumed by the people, habits of constipation were generally induced, and the suddenness of the attack mostly gave us patients with their intestines considerably oppressed with their contents. They were often taken after a full meal of salt meat and dry biscuit, and before its preparation for digestion was half completed by the stomach. Under these circumstances, an emeto-cathartic was exhibited with great advantage. The primæ viæ were evacuated of their offending injesta, and

the cathartic seldom failed under the relaxation, of emptying in some degree the bowels, and preparing the way for the more efficient exhibition of this class of medicines. I did not find the emeto-cathartic increase the irritability of the stomach to that dangerous degree which has been apprehended. The dose I mostly gave was ipecacuanha and calomel, each fifteen grains. By some, calomel and emetic tartar were used. I gave the preference to the former as acting more mildly, and having a more transient impression on the stomach—not thinking any other advantage likely to be derived from the emetic, than its simple evacuant effect. When there was no reason to suppose that the stomach was offended with food, purgatives were first given—and where purging was kept up briskly for two or three days without much intermission, the recovery seemed more easy. If they failed in the early stage, it was a bad omen—and yet I acknowledge it is difficult to pronounce decisively, whether the continued catharsis cured the patient, or only proved the case to be a milder one. The purgatives mostly employed were calomel in various combinations, epsom salts and other saline preparations.

Large irritating injections of warm salt water, with a little oil, assisted much in obtaining early evacuations, which was so important a desideratum in the treatment.

Cold water was freely used during the first three or four days, and always proved agreeable to the patient at this early period. When it became unpleasant to the feelings, producing chills, as it often did on the fourth or fifth day, it was laid aside, and resumed as a tonic during convalescence. It was used by affusion on the head and hands, and by sponging.

Blisters of a large size were applied to the epigastrium early after evacuations, dressed with mercurial ointment, or other irritatory dressings, and seemed useful in some instances.

If there be any state in which the warm bath can be advantageously used, it is when the disease has nearly run its

course, the extremities have become cold, and the vital energy greatly exhausted.

Though opiates and diaphoretics were useful in convalescence, stimulants should be very cautiously employed in the early stage of it. It is in vain to expect the beneficial effects from them here that we find in typhus: on the contrary, no practice can be more injudicious than to over stimulate, with the view of overcoming debility.

I have nothing to say in favour of mercury used as a salivant. In violent cases it will not affect the glandular system. In mild ones it may, but these will recover more speedily and happily without it. It is from such cases it has obtained its reputation, and cures have often been ascribed to mercury, where nothing else was proved than that the consitution not only resisted yellow fever, but also survived the mercurial disease, which was superadded. Evacuations must always precede attempts to give mercury, with a view to its general effect—for if previously exhibited, no practice can be more preposterous and fatal, and by the time it becomes proper to begin, the fate of the patient is decided.

After the black vomit appears, I think we have as yet nothing that deserves the name of a remedy. The only case I ever saw recover after this symptom was the following, and here I gave neither spirits of turpentine nor charcoal, having been so repeatedly disappointed in their efficacy. The only thing I did was to pursue no harsh or desperate measures, and the patient recovered under the treatment: I will not say was cured by the medicines.

An officer of sanguineous temperament and good constitution, had just come to the station and lived several days on shore. He dined on shore the 19th of August, and came on board in the evening sick.

He was freely evacuated, and all the usual measures employed with unremitting assiduity. The disease was not to be arrested, and on the fifth day he had black vomit. While this continued I gave him only a spoonful at a time of gruel, and occasionally a little soda water.

In the evening his skin became cool and clammy, respiration short, yellowness was diffused over his face, neck and breast, his eye was of a brassy yellow, and he had all the usual precursory signs of death. I put him in a warm bath of salt water for about ten minutes, and he complained a good deal of a large blister over the epigastrium while in the bath. He was then put to bed and given two tea-spoonfuls of paregoric in a little panada. He rested tolerably well, and discharged two or three quarts of urine during the night. In the morning he had several natural efforts to evacuate the bowels, and the discharges resembled tar in colour and consistence. Blood oozed out from every little pimple and abrasion of the surface. His stomach retained small quantities of gruel, panada and coffee. He asked for tamarinds, oranges, and several other things, and rapidly recovered.

On the 16th September the vessels left the Island for the Chesapeake. Some deaths took place on board, and a number of intermittents occurred, all having some symptoms of the fever that had prevailed on the Island.

The precise proportion of deaths to the cases of sickness, I am unable to state—but it was probably not greater than usually happens in this epidemic.

ART. IV. *Memoir on Hydrocyanic Acid.* Read before the Medical Society of Augusta, (Georgia) December 11, 1822. By MILTON ANTONY, M. D.

THE splendid improvements of modern chemistry have not only extended the dominion of science and sound philosophy, but they have drawn from obscure recesses, medicinal agents of the greatest power and importance. Such, however, is the tendency of the human mind to pass rapidly to extremes, that a substance is no sooner discovered to

possess *some* virtues, than it is seized with avidity, and is expected to accomplish nearly *all* things—to prove uniformly efficient under every circumstance, without regard to the different modes in which it may be prepared, the condition of the patient, the climate in which he lives, or the character of his malady. Failing in the attainment of the desired results, after a few desultory trials, the remedy is laid aside as inert, or proscribed as too dangerous—in both cases injurious to the physician and his patient.

Such appears to be the impending destiny of the subject of this memoir. It has been said that our remedial resources are sufficiently extensive—that we need no additions to our materia medica—and nothing is wanting but a better knowledge of the agents which are already in common use! Such an opinion is unworthy of serious criticism, as every day's experience is sufficient to convince us how much advantage we might derive from remedies of greater activity and more uniform efficiency.

Hydrocyanic acid has been known as a chemical product since the days of the sagacious Scheele, who was the first person who obtained this substance in a state of purity. By Morveau it was called "Prussic acid," from the material from which it was obtained: in the new nomenclature it is called by M. Gay Lussac, Hydrocyanic acid, by which name it will most probably be known.

The processes by which the hydrocyanic acid is to be obtained are various, and furnish us with this fluid in various degrees of purity and concentration. The method pursued by Scheele, by M. Planch of Paris, Professor Cooper of Columbia College, and Dr. Nimmo of Glasgow, have been frequently published and criticised. The process I have employed, is nearly the same as that given by Scheele, differing chiefly in this, that instead of running over a certain proportion of the liquid cyanide of mercury and sulphate of iron, which results from the boiling, I run off a proportion of the quantity of water originally employed, which necessarily makes the products of this operation uniform in strength.

The hydrocyanic acid prepared in this way, I have used abundantly during the last nine months, and have found its effects almost as uniform as those of any other remedy in the materia medica: notwithstanding my expectations from this medicine were, from the first, very high, I am pleased to state that in my experience with it, I have been greatly and agreeably surprised. It has not been used by me in those coughs attended by high pneumonic inflammation—but in almost every other cough that has occurred in my practice, I have used it, and in every instance with beneficial results. These coughs varied in every degree, from the common and simple form of catarrh to the last stage of tubercular consumption.

The hydrocyanic acid is a medicine of very peculiar character. The access of atmospheric air, light or heat, decomposes it—its volatility is great, and to the ease with which it is decomposed may be attributed many of the failures which have ensued on its administration. I have kept it for some months with no greater loss than one half of its original strength. It is best preserved in a vial corked and secured with a piece of bladder, in an opake vessel containing cold water, which should be deposited in the coolest place convenient.

The following cases will enable the reader to judge of the importance and utility of this remedy.

March, 1822. Miss —— had for several months suffered from a most severe and convulsive cough, which harassed her day and night—pains in her breast and head—countenance bloated from the violence of her disease. She had frequently tried the full antiphlogistic treatment, the use of pectorals, demulcents, &c. &c. without the slightest amendment. Despairing of success from any other plan, I resorted to the use of the hydrocyanic acid, according to the following formula:

℞. Acid hydrocyan. gtt. iv.
Infusum lini ℔j.
M. cujus capiat ℥iv.
Om. xii horas, dosibus cochlearis magni.

She began at twelve o'clock on the 17th, and during that afternoon, and on the forenoon of Monday the 18th, she had taken ℥viij. or gtt. ij. of the acid. She informed me that she had passed a good night, having coughed lightly only two or three times during the night, and also on the forenoon of Monday. The acid was continued—saw her on the 19th after she had taken the fourth drop of acid—had coughed once on Monday night, and once on Tuesday morning, without the least inconvenience. Four drops more of the acid were prepared, and directed to be used as before—perfect health ensued immediately after its use. Some weeks after, this patient, by imprudent exposure, provoked her cough, which was somewhat severe for a few days, but soon disappeared without remedy.

Case second.—E. S. entering on her 9th year, for many months in feeble health—occasional symptoms of disordered bowels, and a catarrhal affection. Had a pleuritic attack about 22d March, 1822, when the disease was suffered to advance for several days without remedy. By the usual treatment the pain was subdued, but a troublesome cough to which she had been long subjected, remained with its full violence, accompanied by considerable fever. Her pulse did not call for blood-letting. She continued in the same condition until about the 11th of April, when I ordered the following medicine:

℞ Acidi hydrocyanici, gtt. vj.
Infus. Lini ℔jss.
Cap. coch. mag. o. h. (in horas xvi diei.)

This acid was four weeks old—had been kept dark, and well corked up. I saw her in twenty-four hours after the prescription had been administered—when ij. gtt. of the acid had been taken, cough diminished about three-fourths—fever gone—all changes favourable.—15th. Acid has been continued—child perfectly well, and at play in the open air.

Case third.—J. T. formerly had an ulcered leg, which during several years had occasionally healed, but for the last twelve months continued open and extremely ill conditioned, defying all treatment. Tibia and fibula considerably diseased, and all the parts about the sore, which was

above the ankle, appeared callous. The sore was exquisitely sensible, and discharged a very offensive ichor. Phthysical cough during the whole of 1821, and hectic during the last ten months of that year.

On the 26th I amputated the leg, and dressed it in every way favourably for the occurrence of adhesion—an apparently good union followed, and on the tenth day after the operation the stump was healed, with the exception of a small spot. The patient went home a distance of seven or eight miles. From this time the wound changed in appearance, the edges separating so widely as to make a most troublesome ulcer, which resisted every plan of local treatment. The hectic returned with increased violence, and the cough was extremely aggravated. On the 21st March I ordered two drops of hydrocyanic acid a day, and on the 25th the cough and hectic symptoms were reduced about one half. She was then directed to take three drops a day, until the cough should cease. At the end of two days from the last increase of the dose, the cough and fever entirely ceased, and neither have since returned. I was then for the first time informed that some two or three years before, the patient had suffered from syphilis, which had disappeared, though without the ordinary treatment. I was then enabled to account for the peculiar obstinacy of the sore on the ankle, previous to amputation—the unexpected separation of the integuments after the formation of adhesions, and the subsequent ill condition of the wound. By resorting to the use of mercury,* the stump healed kindly by granulation. In this case we have a strong evidence in favour of the powers of hydrocyanic acid, in the relief of a cough produced by a sympathy of the lungs with a disease resulting from a venereal taint. The patient has since enjoyed uninterrupted health.

The fourth case in which I used the hydrocyanic acid, was originally a hepatitis, which for many years had been chronic, during which time the lungs had become exten-

* Might not the use of mercury have superseded the use of the knife? And in doubtful cases should we not always give it a trial?

sively ulcerated. She had hectic fever with emaciation, very constant distressing cough, with copious purulent expectoration. She began with three drops a day, which was gradually increased to seven. On the eleventh day after commencing the use of the acid, the cough had so far abated as to need no farther remedy. It was slight, and the expectoration easy, being without distress or fatigue. The symptoms were thus alleviated until she died, which was in about a month after.

The fifth case was confirmed phthisis pulmonalis. This patient began with three drops, and continued until the quantity was increased to five drops a day. The cough was kept moderate and the expectoration was easy. The patient died in a few weeks.

Case sixth.—This was a lady who some weeks previous had measles, during which no remedies were employed. A distressing cough followed, and I was suddenly called on the 14th of April to attend to a *prolapsus uteri*, caused by the violence of the cough. The uterus was replaced, and the recumbent position directed until the cough should be moderated. She began to take three drops of the acid a day. On the 15th she was so much better as to walk in the garden without fear of producing the prolapsus. Two days after her cough totally cased.

Case seventh.—Was that of a young lady whose disease arose very much from a habit of tight lacing, which acting on a predisposition to pulmonary disease, produced all the distressing symptoms of phthisis. The use of the acid in this case, produced a very decided amelioration of the symptoms, but the disease was too far advanced to be entirely checked. The fatal event succeeded.

Case eighth.—A lady fifty years old, having apparently phthisis pulmonalis, with emaciation and regular hectic—cough always troublesome, more especially in the morning. She began with the acid in the quantity of three drops, which was gradually increased. She employed the acid until about ℥iv. were consumed, and in the summer fol-

lowing, she was apparently in good health, which still continues.

Case ninth.—Pulmonary consumption following obstruction of menstrual discharge. Patient twenty-one years old, greatly emaciated, regular hectic, much cough and purulent expectoration. Began with three drops of the acid, 10th of April, 1822. On the 14th the cough had ceased, and had not returned on the 22d, when she returned home.

Case tenth.—A child aged five months, very delicate, and much reduced by a severe fever. A very distressing cough remained for many days, notwithstanding the use of ordinary remedies. Directed half a drop of the acid, diluted with twelve tea-spoonfuls of linseed infusion, which was given during the day. The cough was in this time almost entirely removed, and the health improved so fast that but two or three doses were given. I state this case chiefly on account of the age of the patient.

I have used the hydrocyanic acid in two cases of pertussis with the most marked advantage, relieving all the distressing symptoms in a very short time.

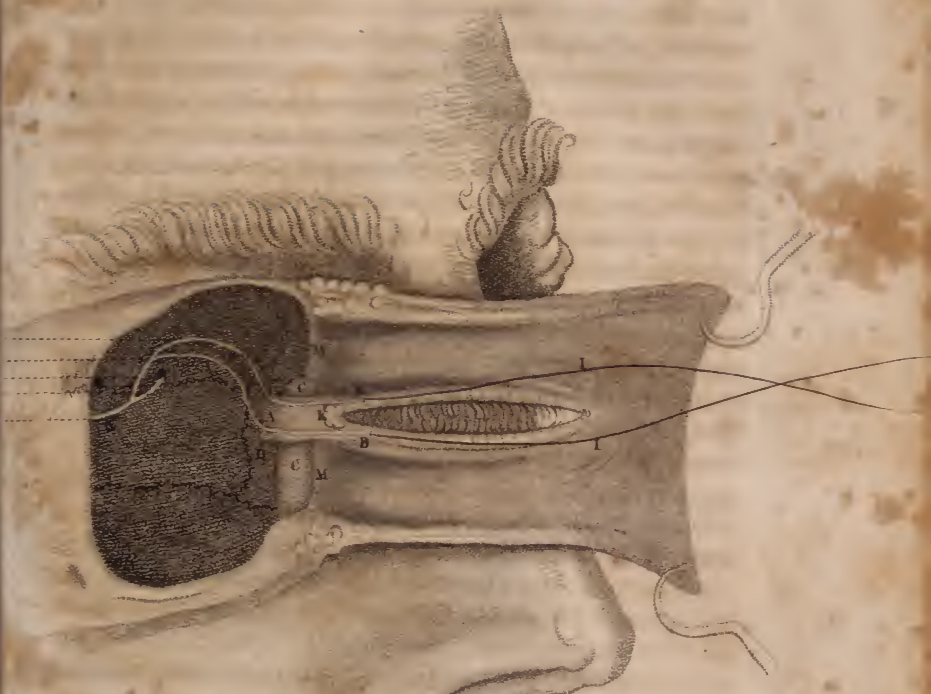
In consequence of its poisonous character, at first I used the hydrocyanic acid very timorously, rarely administering it until the ordinary remedies had failed, or in cases whose desperate nature forbade the hope of relief from the common agents. But now I have become so familiar with the use of it, as to prescribe it as a first medicine with as little fear as of any other substance. My experience in eighteen or twenty cases more, has confirmed my good opinion of this substance, which I believe highly worthy of confidence, and should be an indispensable article in the materia medica.

The *modus operandi* of this substance, is yet a subject of much doubt. The different opinions have been frequently published and commented on, without bringing us very much nearer to a decision on the real state of fact. More must be known of the nature of the nervous system, before we can hope to understand how its influence is exerted.

Since the above was written, an experience of fourteen months in the constant use of the medicine, confirms the statements I have made. Its use has been extended by me to various affections—in eruptions of the skin, attended with much irritation, a lotion of gtt. i. ad. iv. in ℥ i. of water, has frequently been decidedly advantageous. In erysipelas, the irritation has been temporarily allayed by its application. In toothach I have applied it advantageously by means of cotton wet with a solution of gtt. xxx. of acid, in a tea-spoonful of water, first cleaning out the cavity of the tooth. In ophthalmia I have generally found it allay that irritation which forbids the use of astringents. Many cases have been cured by the acid and water alone, mixed in proportion of gtt. v. or vi. to ℥ i. of water. I use it in all pneumonic affections accompanied with cough, and have employed it in one case of asthma with very encouraging success.

Art. V. ***Description of a Small Muscle at the Internal Commissure of the Eyelids.*** By W. E. Horner, M. D. Adjunct Professor of Anatomy in the University of Pennsylvania.

During the winter of 1821 and 1822, while engaged in the dissections connected with the Course on Anatomy, and having at that time under my hands several sheep's eyes, intended to illustrate some points in the structure of the human eye—it occurred to me, that the known apparatus for conducting the tears from the surface of the eye to the nose, was insufficient to account for all the phenomena of this function. The desideratum was, to ascertain the causes of the constant application of the puncta lachrymalia to the surface of the eye, in the several conditions of extreme corpulency, emaciation, sleeping and watching. My mind had been previously prepared for the inquiry, by observing in an elderly acquaintance, a continual running over



n of the Muscle from the Os Unguis.
rmination at the Puncta.
hrymal Sac.
nguis.
d Nerve.
rnal Nasal do.
rnal Nasal do.
anches to the Muscle.

II. Bristles introduced into the Punc-
-ta from behind. The Eyelids be-
-ing turned over the Nose.
L. Caruncula Lachrymalis.
MM. The origin of the Orbicularis
Muscle, at the margin of the
Internal Canthus.

Drawn and Engraved by J. Drayton.

of the tears at the internal corner of the eye, apparently owing to the internal commissure being so loose, that the puncta were in some measure averted from the balls of the eyes. I had also observed, that in a sudden fit of fainting, which had come on the late Professor Wistar during his last illness, and while he was sitting upright, the lower lids of his eyes had fallen from their balls, so as to leave a very conspicuous interval between them. Impressed with these facts, and actuated by the impulse of the occasion, I first sought for a new apparatus in the orbits of the sheep's heads before me, and not being satisfied with what I saw in them, in a minute afterwards I laid open the orbit of a human subject, and forthwith had the pleasure of finding a small muscle, which from its position and connexions, seemed well adapted to supply the defect in the known mechanism of the lachrymal passages. This first dissection has been so frequently and invariably confirmed by my own observations, by those of my associates, among whom I name the very distinguished and indefatigable anatomist, the late Dr. Lawrance, and by the observations of very learned and skilful anatomists in Europe, that though from the beginning I had no doubt of the accuracy of my own perceptions, additional weight will accrue from such testimony.

The muscle alluded to, lies on the posterior face of the lachrymal ducts and sac. It is oblong, being in the adult about three lines broad and six lines long. It arises from the posterior superior part of the os unguis, just in advance of the vertical suture between the os planum and the os unguis. Running forwards for three lines it bifurcates. One bifurcation is inserted along the superior lachrymal duct, and terminates at its punctum or near it. The other bifurcation is inserted along the lower lachrymal duct, and terminates at its punctum also, or near it. The base of the caruncula lachrymalis is placed in the bifurcation. The superior and inferior margins of the muscle touch the corresponding fibres of the orbicularis palpebrarum, where this latter is connected with the margin of the internal canthus of the

orbit—but they may be very readily distinguished from the orbicularis, by their running straight forwards. The nasal face of this muscle adheres very closely to that portion of the lachrymal sac which it covers, and also to the lachrymal ducts. The lachrymal sac rises about a line above its superior margin, and is seen in the orbit to extend four lines beneath its inferior margin. The orbital face of the muscle is covered by a lamina of cellular membrane, and between this lamina and the ball of the eye are placed the valvula semilunaris, and a considerable quantity of adipose matter. The bifurcated extremities of the muscle as following the course of the ducts, are consequently covered by the tunica conjunctiva. If the muscle be examined with the eyelids in situ, it will be seen forming a curve, the concavity of which is orbital, and the convexity nasal. The most satisfactory view of it may be got by making a dissection corresponding with the plate, and the distinction between it and the orbicularis palpebrarum, will be manifested, by the body of this muscle arising at least three lines behind any acknowledged origin of the orbicularis, and in such a way, that the attentive observer will scarcely confound the two into one. The superior fork, however, of the muscle, has a few of its fibres blended with the ciliaris.

A compend of the foregoing description was published two years ago, which having attracted the attention of the Italian anatomists, a very interesting observation has been superadded by the learned Dr. Joseph Trasmondi, Professor of Practical Anatomy in the Hospital of Consolation at Rome. This gentleman, on seeing the account of the muscle in the Medical Observer of Naples for June 1823, immediately verified its existence in a female subject of seventy years. Having further satisfied himself by repeated dissections, he proceeded to investigate the nerves of the muscle, and in a pamphlet, which I have had the honour of receiving from him, he gives the following account of his researches. "We have found in fact by dint of patient and repeated observations, that two nerves

coming from the external nasal branch, derived from the ophthalmic nerve of the trigemini or fifth pair, supply the muscle of Horner."*

"It is known that the ophthalmic nerve gives off, first, the branch to the lachrymal gland—secondly, the frontal branch—thirdly, the nasal branch. It is also known that this last is subdivided, first, into the internal nasal branch, to be introduced through the anterior and internal orbitar foramen, and to be thence diffused in the cavity of the nose—secondly, into the external nasal branch, which until now was, by many, and among others by Bichat, thought to be the only continuation of the nasal branch, prolonged into the internal parietes of the orbit. This writer, in giving a description of the above mentioned branch, says that it is a continuation of the principal branch, and is prolonged into the internal parietes of the orbit—but that having arrived near and under the trochlea, it anastomoses with a filament of the frontal branch, and thence goes out from the orbit and is divided into several branches. The external of which are distributed, first, to the superior palpebra, where they meet the filaments of the frontal branch—secondly, to the inferior palpebra, where they are united to the suborbital filaments, and some of the facial—thirdly, to the lachrymal sac. The internal filaments are then spread, first, on the dorsum of the nose, where they sometimes anastomose with the subcutaneous filaments of the internal nasal branch, which pass from the interior to the exterior of the nose—

* This gentleman has by mistake called me Hermer in his pamphlets, published in the Italian language, and for the translation of which, I am indebted to the politeness of Dr. Jno. Bell of this city.

Intorno la scoperta di due nervi dell 'Occhio Umano ragguaglio del Dr. Giuseppe Trasmondi, Professore di Anatomia Pratica nel Ven Ospedale della Consolazione. Roma 1823. Extracted from the Arcadica Journal, vol. XIX, p. 1, 1823

Risposta del Dr. Giuseppe Trasmondi, Professore D'Anatomia, Pratica nel Ven Ospedale della Consolazione al sig Professore Gaetano Flajani, intorno la scoperta del Musculo D'Hermer e de 'Nuovi Due Nervi Dell 'Occhio Umano. Roma 1823.

secondly on the pyramidalis—thirdly, on the skin. If this most learned anatomist had had the slightest idea of the muscle of Horner, he would certainly have made more diligent researches, nor would the nerves belonging to this muscle have escaped his powerful mind."

"It is now therefore evident from the ascertained facts, that the continuation of the external nasal branch, is not single, but that about six lines distant from the first division, there is a second one forming two ramifications. These are distributed to the cellular membrane, one under, and the other near the trochlearis muscle. From this point the upper one, after having anastomosed with a filament of the frontal branch, and after having given off all those small ramifications to the palpebræ, the dorsum of the nose, &c. turns away. Thence the inferior nerve, also taking its turn, they continue their course, during which they separate from each other, and are implanted into the muscle of Horner, to which they adhere by means of a cellular structure, and pass on to its extremities, and to the puncta lachrymalia, in such a manner that the ramification which had passed under the trochlea goes to the superior extremity, and the other to the inferior one."

The existence of this muscle being fully established by observations which every anatomist can readily verify, it will be extremely useful to ascertain its agency on the motion of the eyelids, and its influence in conducting, or in assisting to conduct, the tears from the ball of the eye to the nose. It appears to me clear, from its origin and insertion, that its contraction in a moderate degree will tend to apply the puncta lachrymalia to the ball of the eye, and is therefore so far efficient in regulating the lachrymal passages, by keeping the puncta immersed in the tears that accumulate at the internal commissure of the eyelids. When the muscle contracts very forcibly, which it can be made to do by the action of volition in certain individuals, and of which I have seen two cases, one in a student of medicine and the other in a lady, it draws the eyelids towards the nose, and buries the puncta and the internal commissure

under the fold of skin which is formed at the same time on the internal canthus of the orbit. I am indebted to Dr. Physick for a further suggestion in regard to its uses. He thinks that in cases of extreme emaciation, where the adipose matter around the ball of the eye is more or less absorbed, causing thereby the eye to sink deeper into the orbit, and consequently to retire somewhat from the lids, the effect of this muscle is to draw the eyelids backwards and to keep them applied on the ball.

Mr. Trasmondi has added so much to my own views of the subject, that I have great pleasure in quoting freely from his pamphlet. He says, that "we now understand how the lachrymal canals, being covered with moving fibres, may by a series of actions elongate—turn their extremities towards the eye—dilate—receive the tears—and then constrict and shorten themselves, so as to deposit them in the lachrymal sac." He also thinks that the compression exercised on the lachrymal sac by the body of the muscle, may afterwards drive the tears into the nose.

The utility of this muscle being supplied by filaments from the ophthalmic nerve, Mr. Trasmondi thinks is thus manifested. A sympathetic connexion is thereby established between the lachrymal gland, the pituitary membrane, and the muscle. In proof of which, if a stimulus increase the secretion of the lachrymal gland, the action of the new muscle is augmented, by which the puncta, the canals, and the sac, quickly receive the separated fluid, and transmit it to the nasal duct. Or if any stimulus affect the pituitary membrane, similar phenomena occur in the rapid secretion and absorption of the tears.

Mr. Trasmondi, in his reflections on this subject, has thought it useful to inquire why the tears, having reached the lachrymal sac, remain there for some time before they are expelled. His conclusions are, that it depends upon the column of atmospheric air which is introduced through the naris into the lower part of the ductus ad nasum, and thus supports the column of tears above, according to a principle well known to the natural philosopher. That air is admit-

ted into the lachrymal sac, under the common circumstances of respiration, he thinks proved by its issuing through the fistulous opening on the face, when one affected with fistula lachrymalis blows his nose. The disproportion between the cubic contents of the canals and the ductus ad nasum is so much in favour of the latter, that the principle is greatly assisted by the mechanism of the parts. Wherefore the tears, passing by small drops from the canals to the sac, will be sustained there till they are accumulated in sufficient abundance: they will then, assisted by the muscle of Horner, press down the column of air and be discharged into the nose.

In the ignorance of this muscle, anatomists have contrived many theories to account for the passing of the tears into the nose. M. Jourdan asserts that in a healthy state of the sac there is never an accumulation of tears in it, in consequence of the sac opening freely into the nose, by which the tears descend as fast into the nasal fossa as they are secreted. He considers it, therefore, perfectly unnecessary to admit of the existence of muscular fibres in the lachrymal sac, particularly as the most scrupulous dissection has not enabled him to find them. But if any fibres of the orbicularis are attached to the external coat of the lachrymal sac, from their being in front they would rather have a tendency to separate the anterior from the posterior part of the sac, than to obliterate its cavity, or to squeeze out its contents. It therefore results, that no other impulsive force than the tonicity of the parts determining the course of the tears, they descend by their own weight, and by adhering to the internal coat of the lachrymal sac. M. Jourdan, in another place, reasoning on this, after positively denying again the existence of muscular fibres on the sac, says: But how does it happen that the tears flowing into the lachrymal sac, (whose sides are of a very unyielding nature) continue to descend into it even when it is full, instead of running over on the cheek, and particularly as the lachrymal canals having but a small diameter, push the tears with but little force? This question is easily resolved by referring to the

established laws of hydraulics. For in fact a liquid discharged into any cavity, by a pipe of a certain diameter, acts with the same force upon all the points of this cavity, whose diameters are equal to that of the pipe, in such manner that the force of impulsion is repeated or multiplied just the number of times that the surface of the cavity exceeds the diameter of the pipe. The tears, therefore, continue to flow from the canals into the sac, dilating it considerably at the same time.

Sabatier's mode of accounting for the passing of the tears into the nose is, that when they arrive near the puncta, they are easily introduced into them—but he is not certain whether this is done by the contraction of the orbicularis muscle, or whether the canals, whose extreme smallness allows us to consider them as capillary tubes, pump up the tears by a kind of absorption.

M. Boyer thinks that the lachrymal passages resemble a syphon, the sac being the long leg and the lachrymal ducts the short one, and that the tears are thus drawn from the surface of the eye. This theory might, perhaps, answer better if the body were always erect, for then we should have on our minds the idea of the long leg being constantly vertical, and of the preponderance of the fluid in it. But as we sometimes lie down, in which case, notwithstanding the principle of the syphon is destroyed, the tears do not overflow, it is therefore clear that M. Boyer is wrong.

M. Bichat says that the entire passage of the tears from the globe of the eye to the nasal cavity is effected through the influence of the vital properties, and not by that of the mechanism of inert fluids in syphons, as J. L. Petit and many others after him have asserted, in comparing the lachrymal canals, the sac and the duct to a syphon, the long branch of which is represented by the latter. He believes, on the contrary, that the absorption of the tears, which continual winking favours very much, occurs chiefly at the moment when the eyelids approach each other, and by turning their margins backwards, the puncta are applied to the surface of the eye. This seems to be still more confirmed by

the overflowing of the tears when we keep the eyelids open for some minutes. M. Bichat, also thinks it well ascertained that the tears continue in the lachrymal sac a certain time before they flow into the nose.

M. Portal, after asserting that no muscular fibres are to be found in the lachrymal passages, advances the same opinion with Bichat, in those words. The absorption of the tears occurring only as the effect of a certain sensibility in the lymphatic vessels and ducts destined to this use, it is not to be doubted that if they lose this sensibility, as occurs in certain paralytic affections, the passage of the tears will be diminished, interrupted and suppressed—as the absorption of the tears would be embarrassed, or would not proceed in a convenient manner if this sensibility should become too great. Wherefore it may be established as a rule, that if tonic lotions are occasionally indicated, the reverse also happens where relaxing and demulcent washes, anodynes, and preparations of opium are far better.

The English anatomists do not seem to have studied this point so fully as the Continental—several of them (among whom is named with some surprise Mr. Pott,) do not allude to it. Mr. Charles Bell, whose book is more read in this country, than the systems of any of his countrymen, introduces in a general way the opinions already advanced, but does not put much confidence in them. He has, indeed, approached much nearer to the true principle of the passing of the tears into the nose, (though he has not exactly hit upon the appropriate apparatus) by asserting that the connexions of the orbicularis muscle over the sac, is of a nature to accelerate the passage of the tears, and even perfectly to compress the sac.

Richter, the celebrated anatomist and surgeon, not succeeding in finding a muscular apparatus, still felt the importance of its existence. Not having his book to refer to, Mr. Trasmondi's pamphlet furnishes the appropriate quotations. "The puncta lachrymalia have doubtless the power of contracting and of closing themselves, and it is very evident that the puncta, as well as the lachrymal canals, when

the palpebræ are closed, contract and become shorter, which cannot take place without muscular fibres." Again, "without muscular powers the lachrymal sac cannot transmit the tears accumulated in it on to the nose, consequently the lachrymal sac is without doubt furnished with muscular fibres."

It appears to me that none of the opinions here introduced, will account for all the phenomena attending the course of the tears into the nose. It is much more probable, that the act is accomplished through the influence of the muscle which I have attempted to describe, aided by the elasticity of the sac. The attachment of the muscle to the posterior face of the lachrymal sac is such, that it draws the posterior parietes of the sac away from the anterior parietes, and dilates the sac, thus tending to form a vacuum, particularly as the nasal face of the sac is fastened to the bony fossa and cannot move. This dilatation is aided by the cylindrical curve of the muscle, whose concavity is orbital, and which curve is brought into a straight line by the contraction of the muscle itself. Now if the diminished diameter of the lower part of the ductus ad nasum with the presence of mucus in it, present a greater impediment to the introduction of air into the lachrymal sac from below, than to the entrance of tears from above, through the lachrymal ducts—it is clear that while the vacuum is thus formed in the sac by the muscle, the puncta lachrymalia, being bathed continually in the tears collected at the internal commissure of the eyelids, will rapidly transmit the tears to fill up this vacuum. But when the muscle ceases to act, the elasticity of the lachrymal sac will drive the tears into the nose, as the mechanism of the passages is such, that it allows a fluid to pass more readily from the eye to the nose, than from the nose to the eye.

If this explanation of the functions of the muscle be correct, it will enable us to understand why, in perfect obstructions of the ductus ad nasum, the sac fills itself to distention, and on being emptied through the puncta by pres-

sure, it will fill itself again. It also suggests the probability of some cases of epiphora, depending only on an atony* of this muscle, and consequently to be removed by such remedies as strengthen it. It is scarcely necessary to say that these cases are indicated by an overflowing of the tears, where there is no proof by examination of the passages being obstructed. And that such cases do occur, the writings of surgeons much experienced in the treatment of fistula lachrymalis will sufficiently attest, notwithstanding the very general assertion of the systematic authors, that the foundation of this disease is always laid by a stricture in the ductus ad nasum.

Art. VI. ***New Division of Apoplexies.*** By M. A. Serres, Chevalier of the Legion of Honour, one of the Physicians of the Hospital of la Pitié, Chief Director of the Hospitals, &c.—Translated from the original by *George B. Taylor*, Student of Medicine.—(Continued from No. 14.)

> "Antequam de remidiis statuatur, primum constare opportet, quis morbus et qua morbi causa, alioqui mutilis opera, inutile omne consilium."
> Baillou, lib. i. Cons. XIV.

SECTION IV.

BASIS OF THE NEW DIVISION OF APOPLEXIES.

Meningeal and Cerebral Apoplexies.

Having shown the false methods into which observers were led by the spirit of system, and pointed out that effusions were effects, and not causes of apoplexy as has been thought—after indicating the errors of all the divisions hitherto proposed, we now come to exhibit such as have arisen

* Mr. Trasmondi has taken a different view of the actions of this muscle, but also believes that a paralysis of it will produce epiphora—a case of which kind then under his care he cites.

from an observation of all the phenomena of apoplexy, and have been confirmed by dissections during many years.

In beginning this research, it appears to me that the first thing to be done, is to ascertain by observation, whether apoplexies present appreciable differences during their development and continuance. Second, whether these differences have any constant relation to the seat of the disease—whether dissection supports or contradicts the principles furnished by observation. Lastly, on the supposition that inspection of the dead shall confirm the data furnished by an examination of the symptoms, can the observer conclude, from the presence or absence of these, on the presumed seat of apoplexies, and by these indications establish a mode of treatment, how nearly may this end be attained?

During the time in which I was striving, if possible, to distinguish sanguineous from serous apoplexies, I followed the erroneous course of my predecessors, and like them came to equivocal conclusions. But when fatigued by my fruitless efforts, and discouraged to find dissections in contradiction with the prognostics of the best practitioners, I asked myself the question, do apoplexies differ from one another by their symptoms? Then I beheld these diseases in their natural condition, as they are presented to all observers.

Being solely employed in following the course of the disease, and in collecting and comparing the symptoms as they arose, I was not long in perceiving that apoplexies had two different forms—one simple and not complicated with paralysis, the other being always combined with loss of motion on one side or other. Was this remarkable circumstance the effect of accident, or did it depend on any discoverable cause? The answer was given to me by the history of a hundred histories of apoplexy.

Of this number, twenty-one were simple—seventy-nine were complicated with paralysis. In the first, dissection gave the following results—sixteen had collections of serum either in the ventricles and cerebral convolutions, or

in the ventricles, or the convolutions separately—one had a sero-sanguineous collection in the left ventricle—two had a similar collection between the arachnoides and pia mater on both hemispheres—and there were two cases without any collection.

In all these cases the brain was sound—the membranes were affected in different degrees—first, in those which were of the longest standing, and the serous effusion abundant, the pia mater was injected, the vessels very much dilated, the arachnoides opake and thickened—second, in that case in which the ventricle only was the seat of the sero-sanguineous effusion, the arachnoides, slightly opake through the rest of its extent, was reddish on the interior of the ventricle, sprinkled with very numerous miliary granulations bounded like the collection—third, this membrane presented a dryness, and a thickening with membranous productions, in the cases which had no effusions.

Did not this constant connexion between the alteration of the membranes and the effusions, point out that these two circumstances were allied to each other? Might we not see in the various alterations of the arachnoides and pia mater, the source of the different effusions, or even the absence of all exhalations in the two last cases? Should not this irritation of the tunica arachnoides of the ventricle, and of the portion which covered the lobes, be considered as giving rise to the sero-sanguineous effusion? A multitude of facts, since observed, allow me to reply affirmatively to these questions, and I believe it may be established as a principle, that in this species of apoplexy *the membranes* are *primitively* and *principally* affected, and that the *different effusions* which are met with, are nothing but *the results* of their alterations.

These circumstances, compared with dissections where apoplexy was complicated with paralysis, acquired a higher degree of certainty. Here were no effusions, either serous or sanguineous, in the natural cavities of the brain, nor in the space between the duplicatures—no alteration in the texture of the membranes—the disease was to them in

some degree a stranger—but the brain materially altered in its structure, appeared to have been exclusively the centre of activity of the apoplexy. Excavations were dug in its structure, and in different parts of the thickness of the lobes—the whole of the surrounding cerebral beds were irritated, reddish, yellowish and hardened, according to the duration of the interval elapsing from the formation of the cavity till the occurrence of death. The blood which filled these excavations or caverns, according to the expressions of Wepfer and Morgagni, was either coagulated or half liquid, as the cavities occupied the medullary or cortical substance, the striated bodies, the optic bed, or even the interior of the ventricles, whither they had often penetrated after having broken through their walls. There was no further doubt of the source of the effusion, for when the blood was removed from the cavity, one of the extremities of the broken capillaries might be seen manifestly floating therein, the other adhering to the mass which surrounded the opening. There was no longer a doubt of the manner in which these cavities were filled—for a fine injection thrown into the carotids, penetrated the cavity and simulated in a degree the effusion.

Before advancing farther I may be allowed to ask the following questions: Why were all these last apoplexies accompanied by paralysis? Why in all the first mentioned was there no injury of the powers of motion? May we not answer, that in complicated apoplexies the palsy is a necessary effect of the organic alteration of the brain, as well as that, in simple apoplexies, the brain being sound, the capacity for motion should of necessity remain unimpaired? If these points are ascertained, may we not deduce the three following propositions?

First.—When an apoplexy does not exhibit in its course any trace of palsy, may we not presume that it is seated in the membranes, and that the brain is not the centre of activity of the disease?

Second.—When, on the contrary, palsies become complicated during the progress of apoplexies, it is no longer the

membranes, but the brain, which is the principal seat of irritation.

Third.—Serous, or sero-sanguineous, bloody or purulent collections, are effects of irritation of the membranes—of the brain—or of arterial or venous ruptures, which may supervene during the course of apoplexies.

If we do not misinterpret the facts, it appears easy to assign proper denominations to these apoplexies. I propose to designate apoplexies without palsy, under the name of *Meningeal Apoplexies*—and those complicated with palsy, as *Cerebral Apoplexies*. I shall speak of *Cerebellous Apoplexies*, which are situated in the cerebellum, in another memoir.

Thus, it is possible during the life of a patient to know what sort of apoplexy we have to contend against. If it is simple, the patient can move all his limbs when he is excited, and the apoplexy has its seat in the membranes. If, on the contrary, it is accompanied by hemiplegy, if the mouth is distorted, it is to a cerebral apoplexy that the physician must attend.

I shall analyze hereafter the whole of the other symptoms which distinguish these apoplexies—but I should remark here how much the bases of the diagnostics are cut off, and this is necessarily the case, for apoplectics most frequently are plunged in a stupor which renders the first traces very equivocal. But it is always possible to acquire a knowledge of the symptoms which ought to guide us, either by rousing the patient, or by the aspect of the mouth alone, the distortion of which is constant in cerebral apoplexies. The other positive signs we shall examine do not allow us to mistake concerning the existence of hemiplegy.

I come now to make known the foundation of the new division of apoplexies, to shew the connexion and relation which exists between the symptoms of apoplexies obtained by observation during their continuance, and the knowledge of their seat, furnished by dissections of those who have died by these diseases. The symptoms being the result

of their seat, we may then acquire exact notions on the place principally affected in different apoplexies.

But I hasten to anticipate an objection which may be urged. If there are no other apoplexies but those now proposed, the *meningeal*, *cerebral* or *cerebellous*, all these diseases have their seats exclusively in the brain or its membranes. In this case, what becomes of the bilious apoplexies which Scroerer, Koch, Boerhaave, Van Swieten, Casimir Medicus, and Stoll, have placed in the stomach and intestines, founded on traces of inflammation discovered on dissecting the bodies of certain apoplectics? To answer this question let us again consult facts.

THIRTEENTH OBSERVATION.

In 1811 and 1812, seven apoplectics were brought to the Hôtel Dieu in the agonies of death, and died from the thirtieth to the fiftieth hour after the attacks, before any thing had been administered by the mouth. The stomach, small and large intestines, did not exhibit the least trace of inflammation.

FOURTEENTH OBSERVATION.

During the same years and the course of 1813, I had an opportunity of dissecting twelve apoplectics—four had been treated with emetics, frequently repeated, and in large doses, (six grains of tart. emet.) without exciting vomiting—eight were treated with purgative clysters, a trismus resulting from a convulsive state having hindered deglutition.

In the four first I found the stomach and beginning of the jejunum in a state of most intense inflammation—the mucous membrane coming off in flakes, leaving the muscular coat naked—some black spots were here and there scattered over the colon—the peritoneum was partially inflamed over both. In those who could not swallow any thing, and had been treated with purgative clysters, there was no perceptible lesion of the stomach, nor small intestines—but all the large intestines from the valve of the colon to the extremity of the rectum were contracted—the internal mem-

brane deep black, and flaky lamina of an inch and eight lines floated within them, and the peritoneal and muscular membranes partook of this acute irritation.

The question might be asked here, whether emetics and purgatives are more dangerous in apoplexies than in other diseases? which shall be attended to in speaking of the treatment. It will be sufficient for me to state in explanation of the facts I am about to relate, that paralysis of the intestinal canal is often complicated with apoplexy.

I conclude from these facts, that the inflammatory traces which were found in the bodies of these apoplectics, were effects entirely produced by the action of medicines, and altogether foreign to the development of the apoplexies—as first, the patient died without taking any thing, and there was not the slightest trace of inflammation in the stomach and bowels—and second, as inflammation is found on the stomach and small intestines, when vomits and purges have been given, and solely on the large bowels when purgative clysters have been employed.

Thus inflammation manifests itself wherever the irritants were applied, no inflammation existing if they have not been used. The inflammatory traces observed on the alimentary canal of apoplectics, cannot be regarded as a cause of this disease.

Let us examine the analogies after having exposed the facts. We daily observe acute and chronic gastrites and enterites which are never complicated with apoplectic symptoms. All the epidemic fevers affecting mucous surfaces, observed in Europe, have caused irritations more or less acute, of the stomach, duodenum and small intestines: has apoplexy ever been complicated with their progress? I find no examples among those observed by Baglivi at Rome, by Roederer and Wagler at Gottingen, Sarcone at Naples, Borelli and Malpighi at Pisa, and Weitbrect at St. Petersburg. Neither do I find that they have marked the apoplectic symptoms as accompanying the fevers, which, according to Baillou and Frank, have their seat in the stomach,

nor in those which Heister and Ridel inform us are caused by intestinal irritation.

It is then an error which leads these authors to attribute the appearance of certain apoplexies to different degrees of irritation, which they have observed by their effects on the stomach, the large and small intestines, after the death of apoplectics.

We may regard this proposition as established on facts—that *all apoplexies* are seated *primitively* in *the brain*, *the cerebellum*, or *the membranes*.

(To be continued.)

Art. VII. *Anatomical Investigations.* By John D. Godman, M. D. Lecturer on Anatomy and Physiology.

SECTION I.

In the twelfth number of the Philadelphia Journal, I published some observations on the general character and extent of the *Fascia Superficialis*. Since that time I have been engaged in a series of minute investigations relative to the different fasciæ of the body, and have reason to believe that these researches will enable me to give a more accurate and useful account of these structures than has hitherto been presented to the profession.

Among the most interesting of the arrangements observed, is that of the *fascia superficialis*, on the front and lateral parts of the neck. The paper above referred to contains a description of the manner in which the sterno-cleidomastoideus is included by the external and internal layer of the superficial fascia, which last has heretofore been considered to be the deep seated fascia of the neck. By my recent examinations, the correctness of what was advanced relative to the sheath of the mastoideus was throughout confirmed—but I have been led to remark that the arrange-

ment of the fascia below this muscle is very different from what is usually represented, and that the true character of the fascia has not hitherto been made known.

In order to make the description as clear as possible, it will be necessary to repeat a part of what was before stated concerning the fascia, as it passes from over the thorax to ascend on the neck, and also slightly to modify the description.

If we begin about midway between the clavicle and fifth rib, to raise the fascia superficialis towards the clavicle, we shall find when we arrive at the origin of the platysma myoides, that a layer of the fascia, which is thin and delicate, goes over the surface of this muscle, while a stronger and denser layer, continuous with the part raised from the thorax, runs underneath the platysma, and extends upwards to the zygoma. By this the masseter muscle and parotid gland are covered, and their figures concealed. Should we now commence in the centre and dissect the platysma myoides carefully off, we have a fair view of the external layer of the fascia superficialis, leaving out of the account the slight covering of the platysma myoides.

Next make an incision over the centre of the trachea, extending from the base of the os hyoides to the top of the sternum through this external layer. It may then be raised easily, towards the outside of the neck, until we have fairly laid bare the whole of the sterno-cleidomastoideus. If we cut off the origins of this muscle, and raise it carefully from its bed towards its insertion, without cutting the fibre of the muscle or the subjacent fascia, we shall see that the portion of fascia traced from the front of the neck over the last named muscle, splits just at the outer edge of the mastoideus, sending one layer outwards and backwards, (over the muscles of the neck and head) while the other runs inwards and forwards towards the centre of the trachea, and thus forms the lower part of the sheath for the mastoideus. This layer, immediately under the mastoideus, covers the internal jugular vein, the omo-hyoideus, and near the centre of the neck lies over the sterno-hyoideus. Thus far my researches were extended in the former essay, but it will be

seen that the subsequent inquiries have led to a more extensive acquaintance with the true character of the fascia of the neck, and enable us to understand the manner in which the sheath for the great vessels is formed. To be convinced of the fact that *all* the fasciæ of the neck are processes of the *fascia superficialis*—to be assured that there are *six* distinct layers, or processes of this fascia on the front of the neck, and that the sheath for the vessels is formed by horizontal slips stretching from the anterior to the posterior portion, above, below and between the jugular vein, carotid artery and eighth pair of nerves, it will be sufficient to pursue the following order of examination.

Suppose the superficial layer, or portion covering the mastoid, to be turned back as far as the outer edge of this muscle, and the muscle raised so as to exhibit the continuity of the outer and second layer. Then make an incision over the sterno-hyoideus (through the second layer,) from its origin to its insertion, and raising this layer towards the outer part of the neck, we shall find it forming a beautiful sheath for the omo-hyoideus, precisely analogous to that made by the superficial portion for the mastoideus, but being oblique to suit it to the position of the omo-hyoideus. Tracing this layer to the outer edge of this muscle, we raise the muscle from its bed, without injuring the subjacent fascia, and then we have this under portion, lying over the thyroid gland, and immediately covering the sterno-thyroideus muscle.

Let an incision next be made through this third layer, over the sterno-thyroideus in its length, and we raise the fascia as far toward the outside of the neck as to the carotid artery, and then we shall see how beautifully the process for the omo-hyoideus sets off from this third layer, which is on a level with the jugular vein, and continuous with the sheath of the mastoid muscle.

There is yet another distinct process going off from the fascia, where it touches the lower edge of the carotid artery. This fourth process runs forwards and inwards, covers the thyroid gland, and stretches across the front of the trachea

under the sterno-thyroideus. If this layer be turned back towards the carotid artery, and the vein and artery be raised by pulling the superficial fascia upwards, we see a perpendicular process of the fascia, reaching from the under surface of the vessels to the muscles lying immediately on the bodies of the vertebræ. This perpendicular process is double. One part goes outward and backward, till it reaches the transverse processes of the vertebræ where it is attached or inserted, while the inner portion goes immediately over the rectus internus, capitis major and longus colli, across the bodies of the vertebræ, extending under the œsophagus, and is continuous with the corresponding layer of the opposite side.

The formation of the sheath for the great vessels of the neck now remains to be described, and may be easily understood, when it is recollected how the layers of the fascia are disposed. A covering is formed over the jugular vein by the fascia, where it is passing under the mastoideus. Then another slip passing from the anterior to the posterior division of the fascia, runs below the vein, and separates the jugular from the artery and par vagum, and the lower portion is formed by a continuation of the fascia under the carotid artery. From the centre of this lower part of the sheath, the double perpendicular process descends.

To demonstrate this most satisfactorily and easily, make an incision through the fascia under the mastoideus, in the course of the internal jugular vein—raising this covering of the vein, we should then take an inch or two of the vein from its bed, without wounding the parts below, and we shall see the slip of fascia separating the vein from the artery and par vagum. In like manner, if we cut through this partition and carefully raise the artery, removing an inch or two of the vessel, we then perceive the lower part of the sheath lying immediately under the par vagum and artery. By breaking through the lower part of the sheath, we may separate the layers of the perpendicular, or fifth and sixth processes.

In relation to all the peculiarities mentioned in this de-

scription, I can safely state that the research was undertaken with a view to no system, nor to support any preconception. The investigations were made in the presence of a class of students, in every instance, most of whom had attended two courses of anatomical lectures, and were considerably experienced in dissecting. They were stationed as near as possible to the table, and requested to suffer nothing to pass them as ascertained, of which they were not entirely convinced by the demonstration. They saw every touch made with the knife, and were thoroughly able to judge of the difference between what really existed, and what might have been accidentally produced. The results of all the investigations exactly corresponded with the descriptions given. There was no ambiguity either in the continuation, extent, or density of the fascia and processes.

It is much easier *to demonstrate* the whole of this structure, than to convey an accurate idea of it in writing. The repetition of technicals and a want of *precise* recollections of the surrounding parts referred to, necessarily gives an appearance of obscurity to a minute anatomical detail. Should any reader feel sufficiently interested to wish for a sight of these arrangements of the fascia of the neck, it will give me much pleasure to make the demonstration at any time when there is a proper subject in my rooms.

SECTION II.

Arrangement of the Fascia Lata.

In examining this fascia, after having studied the arrangement of the fascia of the neck, the observer will be surprised and delighted to find that there is a most striking similarity existing between them, not only in the manner in which they relate to the muscles, but in the formation of the sheath of the vessels.

To begin this examination, we remove the integument and fascia superficialis from the posterior part of the nates, and are enabled to see how far the fascia lata extends on the ilium from the part which may be properly considered as its origin, being all the edge of the ilium not occupied by the

origin of the glutæus maximus, out to that portion of the border of the ilium giving origin to the tensor vaginæ femoris, immediately behind the anterior superior spinous process. The tensor vaginæ is fairly enclosed between two layers of the fascia lata, which joining at the anterior and inferior parts of the muscle, form that strongest part of the fascia denominated the *iliac* portion, or part covering the haunch.

This iliac portion advances very little at the upper part, before it again separates into two layers, the one going *over* the sartorius muscle, and the other under it. The superior layer is thinner than the common fascia, and allows us to see the muscular fibre through it—while the fibres of the muscles on the outer part of the thigh, are entirely hidden by the thickness and opacity of the fascia. In consequence of the separation mentioned, a beautiful sheath is formed for the sartorius, resembling in every particular that formed by the superficial fascia in the neck for the sterno-cleido-mastoideus.

If we cut through the layer covering the sartorius, in the direction of the muscular fibre, a short distance from its outer edge, and then raise this external portion towards the ligament of Poupart, we find that it reunites with the inferior layer just beyond the internal edge of the tensor. Let us now cut for the tenth of an inch through this union and we shall see the fascia again separating into two layers, having a considerable interspace, which in many subjects contains an appreciable quantity of fatty matter. This part of the fascia is situated anterior to the upper part of the sartorius, and would be contained in a triangle made by drawing a line from the middle of the symphysis pubis to the sartorius, having the ligament of Poupart for the opposite side of the triangle, and the muscle for its base. Having made the opening required, we may then push the handle of the knife up to the lower border of Poupart's ligament, below the anterior superior spine of the ilium, and by continuing the pressure downward and inward, we may carry the instrument entirely to the extremity of that duplicature

which is called the *falciform process*, semilunar process, or *Hey's* ligament, without using any violence. By this last view we are made acquainted with the manner in which the pubic portion comes up under the vessels to join the parts described.

Were our examinations to cease here, they would be of comparatively little value, however interesting the research might prove to the individual. But I flatter myself that the discovery of the peculiar arrangements of this fasciæ, will lead us at once to a better acquaintance with its physiology. The outer layer, or that part which may be considered as the continuation of the external part of the sheath of the sartorius, is *continuous* with the *tendon* of the *external oblique* muscle, which is thus enabled to act very advantageously on the fascia. The *fascia lata* is provided with a muscle whose peculiar business is to tighten this great sheath of the thigh; as the tensor vaginæ femoris is situated nearly in a line with the external condyle of the femur, which is by no means so low, or rather so long as the internal, of necessity, in tightening the outer part of the fascia to the greatest degree, it must relax the inner portion (covering the gracilis, adductors, &c.) at the upper and inner part of the thigh, which is by no means within its sphere of action. The arrangement mentioned, the continuity (of the external layer of the iliac portion) of the fascia lata with the tendon of the external oblique, compensates for the defect that would otherwise exist, and tightens the part of the fascia lata covering the upper and inner part of the thigh. In saying that the fascia is continuous with the tendon of the external oblique, we do not say that no connexion exists between the internal and external layers, just where the outer one joins the tendon of the oblique. But this union is effected by a very delicate portion, not much more than perceptible, while the junction between the outer layer of the fascia, the continuity with this tendon, is fair and strong, perfectly visible and palpable to all. To prove how thoroughly this arrangement serves the purpose mentioned, it is only necessary to make a slight pressure on the external oblique, or to pull its

tendon with the forceps when the subject is placed on its back, and the integuments and fascia superficialis are removed. We shall then be convinced that a very slight contraction of the muscle is capable of affecting the state of tension of the fascia lata on the inner part of the thigh.

The arrangement of the internal layer forming the under part of the sheath for the sartorius is very interesting, and in relation to the formation of the sheath for the vessels, precisely similar to that of the third layer of the superficial fascia in the neck. At the outer edge of the *sartorius* the fascia splits, to send one portion outwards and backwards over the surface of the muscles, while the inner portion doubling inwards and forwards, runs under the sartorius muscle. It may be considered as the continuation of the external layer--and after thus forming the sheath of the sartorius, it runs onward to cover the great artery of the thigh, just to the inner or pubic side of which the iliac and pubic portions of the fascia are united.

We may now with great facility raise the layer going over the artery. Then we may raise any portion of the artery from its bed, leaving the process between the artery and vein—after this we can raise this portion, cut and lift up a part of the femoral vein, and show the lower part of the sheath strong and fair, going beneath it. From the lower part of the sheath, we find a single perpendicular process going down to be fixed into the linea aspera.

The fascia lata forms all the sheaths for the muscles of the thigh, and continues to form the sheath of the vessels after the artery has passed through the tendon of the triceps. The pubic portion near the ligament of Poupart, passes under the great vessels, and is connected or rather continuous with the fascia iliaca and fascia transversalis. This part of the investigation must be left until we give a description of the researches made relative to the internal fascia, which will be hereafter presented.

However difficult the study of the fascia lata may appear from the description, it is by no means so difficult to understand when it is examined with the knife. When studied

in the manner here directed, the satisfaction derived from the clearer understanding of the physiology of all the neighbouring parts, will more than compensate for the difficulties surmounted by the application necessary to see all that is described. The important influence exercised by the processes of this fascia (forming sheaths for the vessels and muscles) over various surgical diseases and operations, can only be percieved by one who is thoroughly acquainted with its true character, extent and connexions. The establishment of the fact that there is but one fascia forming all the processes about the neck, and another all those of the thigh, and that in both the sheath for a particular muscle, as well as the sheath for the great vessels, are formed in the same manner, is a circumstance of a very interesting kind, and may lead us still farther in our researches concerning the various parts they surround or separate.

In the next number of the Journal the investigation of the fascia transversalis, and fascia iliaca, will be offered in continuation.

SECTION III.

Arrangement of the Fascia Humeri.

We have heretofore remarked, that the fascia superficialis is to be traced from over the anterior part of the thorax and on to the arm. By removing the integument covering the deltoid muscle, and the whole of the arm to the elbow joint, we may raise the fascia superficialis from the fascia humeri down to the elbow, being throughout analogous to the relation of the fascia superficialis in the thigh to the fascia lata, and from the elbow we can raise it entirely down to the back of the hand.

We now see a fascia covering the belly of the biceps brachii flexor, which at a first glance seems to continue entirely around the arm, so as to form a covering to the whole of the triceps. Making a cut through the fascia humeri, directly over the centre of the biceps, we raise the

fascia towards the outer and inner side of the arm. By this we see that the fascia at the inside splits, and sends the portion around over the triceps—and on the outside a similar arrangement exists. If we follow the fascia upwards on the biceps, until we come to the short tendon from the coracoid process, we find the fascia to run under the tendon of the pectoralis major, and by thrusting a knife handle under it along the biceps tendon, we find the fascia to be continuous up to the clavicle, and also going over the whole surface of the pectoralis major, out on to the thorax.

In tracing the fascia towards the inside of the arm, we may observe, that the sheath for the humeral vessels, is analogous to the femoral and cervical sheaths, modified, however, by the different relations of the nerves. When we turn the fascia over, the biceps down towards either side, we perceive a reflection or deep seated portion, going under the biceps, which is thus inclosed very similarly to the mastoideus and sartorius. There is this difference, however, the fascia, instead of running directly or continuously under the biceps, is a reflection from the outer and inner portions, and these reflections meet and run into the centre of the muscle, just where the arteries enter its substance. Then the sheath for the vessels is formed in the same way as in the neck and thigh, except that the number of intersepta or layers, passing from the outer to the inner portion are more numerous, one going between each of the nerves, the artery and vein high up in the arm.

The most singular and interesting part of the character of the fascia humeri, is that which we trace from the outer and back part of the triceps towards the shoulder joint. To do this we follow the fascia from the outer edge of the biceps on to the triceps, and as we arrive at the outer edge of the deltoid, we see it going under this muscle just as the inner portion goes under the pectoralis. At this point we use the handle of the knife, which we can pass under the fascia entirely up to the edge of the clavicle over the shoulder joint, and shall find to our surprise, that this fascia constitutes *all the fibrous structure of the capsule of*

the joint. Having raised it thus, by making an incision directly through the centre of it, we lay bare the shoulder joint, and see at the lower edge of the head of the bone, the beautiful reflection of the synovial membrane preventing the communication between the cavity of the joint and the fascia humeri, which forms its capsule. At the acromial extremity of the clavicle, we find the fascia humeri continuous with the fascia from the spine of the scapula, covering the infra spinatus muscle, and the knife handle may be passed from the upper part of the joint, under this portion. As we follow the fascia humeri lower down on the triceps towards the neck of the scapula, we find it strongly attached to the whole of the inferior border. But if we cut the adhesion to the scapula close to the bone, we then find that the fascia humeri is continuous with the fascia covering the infra spinatus muscle.

Art. VIII. ***Synoptical View of the Principles which should regulate the employment of Blood-Letting.*** By B. H. Coates, M. D.

It is perhaps to be regretted, that the principles which should regulate the use of blood-letting, as well as the operation itself, do not enter into our common works on the materia medica. Its importance, as a curative means, is certainly not undervalued in this country—and it is matter of surprise that we cannot, I believe, find in any of the common books, the same copious account of it, as we possess of various medicines, which it incomparably exceeds in importance. The writers on materia medica and therapeutics seem to have left it to those who have written treatises on surgery, and the latter writers have confined themselves to accounts of the method of performing the operation. This latter, simple enough in itself, requires literary description far less, than the theory of its modus operandi, and the rules which should regulate its application in diseases. To

enumerate these latter, and occasionally remark upon them, is the object of the following pages, and was made the materials of a lecture delivered before the Medical Society in the last winter. They relate, as will be immediately perceived, to practical matters of the highest consequence, and though not abounding in references to authors, are the result of some desultory reading, and some experience and reflection.

In consequence of having been peculiarly situated at an early period of my medical studies, it became my duty to perform the act of blood-letting with discretional instructions, more frequently than most physicians of my age and experience—having done all that took place in the Pennsylvania Hospital for between three and four years. It was, therefore, necessary, and here was the fullest opportunity, to investigate the effects of this remedy upon the system, and to judge of the quantity most advantageous to be drawn. In far the greater number of cases in which any physician prescribes bleeding, the most important symptoms to be relieved are either *pain* or some other marks of violent local excitement. I generally found that, although a partial relief was produced by withdrawing a smaller quantity of blood, this relief was incomparably more prompt, effectual and decisive, when continued either to absolute fainting, or to that less violent collapse which accompanies the nausea frequently following this operation. And it was also a general remark with me, that patients who were relieved in this way underwent less direct debility, less loss of time by sickness, in cases where bleeding shortened the disease, and of consequence had less difficulty in recovering their strength. Upon this hinge, therefore, the following remarks will be in a great measure found to turn.

I conceive, then, that the use of bleeding should be regulated by the following principles. In the first place, as to the occasion, it should be employed only on these conditions.

First.—There must be either a general or local excitement, or a venous congestion, sufficient to produce either

injury to the system, or considerable inconvenience and distress. This must be at least in some measure dependent on the tone of the arterial system—which may be either *increased*, *natural*, or even less than natural.

Second.—This must exceed the controlling power of low diet, and the ordinary febrifuges, and of frictions and the other milder means of relief—and the case must require greater promptitude than is compatible with the use of purgatives or digitalis.

Third.—The importance of the relief to be procured must exceed that of the increase which venesection will produce in the debility subsequent to the termination of the disease. In this debility are included the slight dropsies which sometimes owe their cause to bleeding.

Fourth.—The danger, if any exist, of bleeding augmenting a subsequent debility, or a typhous disposition *in the progress of the disease*, or of incapacitating the patient for bearing subsequent exhausting hardships from the same cause, as in small-pox, must be of inferior consequence to the present occasion for the remedy. This is a consideration totally distinct from the last.

Fifth.—The excitement or congestion must be so far capable of being moderated by diminishing the force of the heart, that equal relief cannot be obtained by cups, leeches, or blisters, or not with so little injury to the system.

In these principles there will probably be few physicians who will differ from me. They are, in fact, a mere systematic enumeration of considerations generally acknowledged and acted on.

In the second place, when bleeding is resolved on, the quantity to be drawn must be regulated by the following principles.

First.—If it be desirable that a certain degree of excitement should still be kept up, and it be consequently only necessary to moderate it, faintness should, in general, be avoided—and the quantity drawn should be varied according to so many circumstances, that it would be tedious to enumerate them here.

Second.—If the object be, without the presence of the last condition, to remove or relieve prominent and dangerous, or distressing local symptoms, bleeding should be continued till some relaxation of the system be produced, as evinced by a slight degree of nausea, by muscular weakness, a swimming of the head, diminution of the warmth and redness of the skin, and in by far the greater number of cases, by an immediate and considerable relief to the pain or other symptom to be removed.

Third.—If the symptom be of great importance, if life itself, the comfort of the remaining portion of it, or intellect be in danger, and if there be no very serious grounds for fearing a dangerous or destructive prostration of the system, the patient should be bled to absolute fainting, the effect be promoted by an erect posture, if not contra-indicated, and this state preserved for a length of time proportioned to the degree of the circumstances just enumerated.

Fourth.—If, however, from the prevalence of either direct or indirect debility, to an alarming extent, this be forbidden, we are reduced to the ordinary rule of endeavouring to calculate the probabilities of benefit in the best manner we are able, and to act accordingly.

Fifth.—If it be feared, from the constitution of the patient, that fainting will occur from other causes, as it sometimes will, too soon for the removal of a sufficient quantity of blood to produce a permanent effect, and that the symptoms will recur with nearly the same violence—the well known causes which augment this tendency, such as heat, want of air, the erect posture and alarm, should be removed previously to commencing the operation, and we should sometimes even set the vein bleeding a second time, after the patient has recovered from his state of depression.

Some readers will doubtless remark, that most of these rules contain nothing but what is well known and familiar to all. It will, however, be acknowledged, that bleeding is frequently performed without a reference to all the circumstances of the case, and I therefore hope to be excused for

thus reciting them, particularly as they are necessary to introduce the subject, and to methodize what we have further to say.

And here, I am well aware that bleeding is probably, of all remedies, the one which most depends upon the judgment of the practitioner. There is, perhaps, absolutely none which so entirely requires the exercise of discretion in its application—and no set of rules can possibly be drawn which can supply the place of this, or even in many instances, enable one practitioner to judge with confidence of the correctness of another. So many, and so varying are the considerations which affect this important means of cure.

We shall now proceed to run over our rules successively, and occasionally expatiate a little upon particular points.

And first—our first condition of blood-letting will hardly, I think, be denied. The diseased conditions which bleeding relieves, consist in increased excitement, or in venous plethora of some part of the body, unless there be, as I am by no means convinced, such a thing as a general inflammatory fever, without a particular local determination. This local derangement may be either arterial, or it may consist in the violent excitement of some other part of the body, as of the nerves or muscles—but it must in both instances depend, for its continuance or its violence, upon the tone of the arterial system, and be thus capable of diminution, by diminishing the force with which that system is distended. The same is the case with venous plethora—as in some apoplexies, and in pneumonia notha. In these instances, as is well known, we are not only obliged to bleed when the force of the arterial action is greatly increased, but in many cases even when it is natural or diminished. I shall also cite, as an additional instance of this last remark, Rush's depressed pulse, which I have often observed, and which is in a greater or less degree much more common than is sometimes supposed: as also the great advantage which is frequently derived from bleeding maniacs, when the pulse is very much indeed below the na-

tural standard—so far so, that the remark is to a great degree justified, that the pulse in this disease is no guide.

I presume it will not be necessary to dwell long upon the second article, as probably none will differ with me on the principles by which we decide, between blood-letting and the common mode of dissipating local excitement by nitre, antimony, sudorifics and frictions. Antimony is a powerful relaxer of the whole system, including both arteries and nerves, and is often an excellent substitute for blood-letting. As I shall endeavour, however, to show in a subsequent paragraph, blood-letting does not produce its best effects till nausea and faintness are produced, I shall remark, that for the same object, antimony should be given to a sufficient amount to produce the same symptoms. The powers of this substance are by no means fully employed by physicians of the present day—and this has given occasion to Balfour and others to revive in their minds what has been well and familiarly known in former times. There are well authenticated cases, some of which have occurred within my own knowledge, of serious inflammatory attacks being cured by tartar emetic alone, employed to produce nausea and vomiting. It has lost much of its reputation by the nicety of Dr. Fordyce and others, in directing its administration in too small doses, to prevent the distress of nausea. That these physicians were influenced by a fear of losing their patients by producing uncomfortable feelings, would be a harsh suspicion—but it is to me matter of astonishment, that they could fall into such an error as to suppose that it was better to avoid nausea. Nausea from tartar emetic, will relieve inflammatory pain to an extent materially beyond what is generally supposed. As an instance of this, it will give great relief, as I have observed, in the distressing pain of a paronychia.

Purgatives and digitalis, requiring as is well known, a considerable time to produce their effects, can only be substitutes for venesection, when the nature of the case admits of delay.

The fear of what is termed debility, as a consequence to be deprecated from the use of blood-letting, fairly re-

solves itself into two distinct questions—first, whether the weakness and exhaustion which follow an attack of illness will be so much increased by the remedy, as to overbalance the utility to be derived from it—and secondly, whether the same judgment is to be formed of the depression and apparent and real debility, necessarily ensuing in the subsequent stage of the attack, and which in many instances are exhibited in the typhous tendency so frequent towards the close of fevers. The first of these, the weakness remaining after the close of the disease, is principally injurious by protracting the patient's recovery and return to his ordinary occupations, and by producing or increasing a predisposition to other distempers, or to a relapse; here we are again obliged to recur to the judgment of the physician, as the only means of guiding us through such a variety of circumstances, to a just estimation of the comparative advantages and disadvantages of what is proposed. A judgment which alike requires the natural possession of a clear intellect, a due mixture of courage, firmness and caution, free from prejudice and predominant fears, a consciencious desire to do what is right, with a rational self-satisfaction as to consequences, an accurate acquired knowledge of the structure and functions of the body, a certain degree of experience, and a careful and close investigation of the case.

As these conditions differ in individuals, there will, inevitably, always be a very material difference in their judgment. Of this there is no tribunal to decide—and when a man reasonably well qualified according to general principles, undertakes the care of a case, it rests entirely and exclusively a question between himself and his own conscience, in what manner he shall treat it, as no other power can interfere. I believe it to be, however, a very general rule, that if we bleed till a certain effect, previously resolved on in our own minds, is produced, and without limiting ourselves to predetermined quantities, but following the strength and peculiarities of the patient, till a decisive change takes place—that if we do this in the early

stage of tonic diseases, a smaller quantity of blood will require to be taken on the whole, and less debility remain on recovery. In the clear and well marked cases, then, in which bleeding is our principal agent, we come to the conclusion, to execute it with decision in the first instance, until as much relief is obtained as we can reasonably calculate on, and then economize our patient's blood, as far as possible, during the remainder of the complaint.

There is a practice which in modern times is principally owing to Dr. Rush. I mean that of frequent small bleedings in fevers, with a view to moderate the symptoms. That this, in a simple synochus of easy cure, would be a blameable waste of blood, is a conclusion perhaps embraced in that to which we have just arrived—but in the more violent and obstinate diseases, when life is the question, it is often an anchor of hope. The danger of these cases is always; or almost always, in a principal degree dependent on inflammation or congestion of some vital part of the body, which, by this repeated diminution of the force of circulation, is gradually relieved—while at the same time, the powers of the patient are so much reduced, that a copious evacuation would be unsafe. In violent bilious fever, for example, and in yellow fever, this practice appears to be, not unfrequently, highly useful.

And thus we find ourselves fairly involved in the next branch of our subject, which regards subsequent debility or depression during the disease itself. This affords ample grounds for a prolonged inquiry into its application. My bounds, however, oblige me to be very brief. I ask leave, then, to tell those practitioners who fear, as I presume some will, that I would inculcate too bloody a system of practice, that I do really and fully believe in the existence of a typhous tendency in many fevers, and that caution is necessary during the prevalence of such a tendency in the prevailing diseases, to avoid increasing the danger of it by indiscreet evacuation. The general course of diseases at the time, affords our principal guide to a correct estimate of this danger—and the fact is now too well established to be con-

troverted, that the same disease in different years, will require extremely different modes of treatment. Vast differences also arise from the peculiar constitutional or accidental circumstances of the patient—as a far different practice will unavoidably force itself upon the physician, in the hovels of the chilled and half-starved poor, from that among those whose mode of life promotes health and strength in a higher degree. We are hence obliged to compare the danger of this occurrence and aggravation of a typhous stage, with that of a greater derangement of the viscera—and where they are opposed to each other, to decide in favour of the less destructive. There are, however, good reasons for believing that in many cases of fever having a typhous tendency, this disposition is to some extent owing to local injury to the viscera, of the kind which is relieved by blood-letting—and from this cause, whenever strongly indicated by the presence of pain, and sometimes, perhaps, of mere heat, accompanied with a pulse not below the healthy force, and where, at the same time, the typhous tendency was not peculiarly rapid in its effects, I would not refrain from cautious bleeding. There is too much evidence published among the writings and conversation of physicians, to allow me to doubt that typhous symptoms are in some cases allowed to occur, when they might by these means have been prevented. I speak here of the authority of others, because I conceive this last to be a point of which it is impossible for any single physician to judge merely from his own experience. His views and habits make his practice run in a particular way—and it is only by comparing the results and observations of different persons, that he can make a just conclusion. The general diminution of the ratio of mortality in the hospitals of the British islands, a country peculiarly obnoxious to typhus, which is acknowledged in the journals to have occurred, since the fear of debility inculcated by Cullen has given way to the solid pathology, and a more free use of bleeding, is the strongest and perhaps most unanswerable argument which can be

alleged in favour of not prohibiting the use of bleeding in typhus.

In some cases of disease accompanied with peculiar circumstances, as in small-pox, the free evacuation which seems to be called for by the violence of the early symptoms, is of necessity checked by the recollection that the patient has still to undergo a tedious and exhausting stage, which cannot be prevented by blood-letting in the early part of the attack, and which will require the whole of his strength, unimpaired, if possible, by exhaustion of any kind, to enable him to resist its destructive powers. It is to be feared that lives are not unfrequently sacrificed by imprudent venesection under these circumstances. This principle has, I believe, been generally recognized and acted on by the physicians of this city, during the present epidemic.

Of our fifth and last principle, which considers the relative advantages of bleeding and local depletion, I need not here speak much more at length. Of cups and leeches I shall again treat, when I come to consider the *quantity* of bleeding. Blisters may sometimes serve as a substitute for bleeding, but are more generally required, as is well known, as an additional means after the performance of it.

We now proceed, in consequence of our arrangement, to inquire into the principles regulating the quantity of blood to be abstracted at the operation.

Of the first case, where it may be still necessary to preserve a degree of preternatural excitement, although we wish to moderate it, I may cite as examples, the gout, and several eruptive diseases, where a retrocession is dangerous. The case will always dictate the practice—except where it is involved in disputes into which I cannot now enter.

The three remaining sections into which I have divided the subject, although I have believed that it was best to state them separately, are so intimately connected, that I shall take the liberty of grouping them together for a common investigation. As it may elucidate the subject, I will run over some of the changes in the system, which take place during the abstraction of blood. I judge of the tone

or tension of the arteries by what is called the *strength* of the pulse, or the power by which it resists pressure. Dr. Parry has clearly shewn that it is only by pressure that we judge of the pulse. We contract the cavity of the artery with our fingers, and estimate the force with which it endeavours to recover itself, both during and between the impulses of the heart. This strength is the combined effect of the contractions of the heart, and of those of the whole system of arteries taken together, and extending them as far as they are directly influenced by the heart. It requires, first, a propelling force acting on the blood—and secondly, that the vessels should not give way before it, without considerable resistance, operating in the manner of pressure.

When this pressure is preternaturally increased, what is called *hardness* is produced—by which I understand greater strength, distending the artery to a smaller volume than is proportioned to it in the ordinary state.

That the heart, in a hard pulse, exerts considerably more force than in its ordinary state, is not only evident from reasoning, but has been directly shewn, in the clearest manner, by Laennec, in his work on the diseases of the chest. Any one who has used the stethoscope will recognise at once, on trial, the circumstances here described—as it is one of the most easily verified of all the observations made by that invaluable instrument.

Lastly, the quantity of blood circulated through the whole body, is to be judged of by the strength and volume combined.

Frequency arises from nervous irritation—sometimes from congestion or inflammation of a viscus—sometimes from the weakness of the heart itself, and its inability duly to propel the mass of blood—and sometimes from other causes. On this I shall not dwell. Now when a vein is opened, it is in most persons some time before any perceptible change takes place—two, three or more ounces of blood flowing without any apparent effect. By degrees, however, in the greater number of cases, a very slight diminution of force and sometimes of frequency takes place.

The muscular strength is seldom perceived at the time to be diminished—but that effect is immediately visible when exertion is attempted. The very gradual diminution of which I speak, is accompanied by a diminution, slow in a corresponding degree, of the violence of the symptoms: and here those bleedings which are directed by the number of ounces, with no reference to faintness, mostly stop.

If the quantity to be drawn be greater than produces these effects, or if it be resolved to continue the operation until greater relief is afforded, after this stage has continued for some time, the pulse begins very suddenly to diminish rapidly in volume, and at the same instant nausea, muscular weakness, a diminution of the mental powers, with a swimming in the head, commence. Inflammatory pain, unless in very bad cases indeed, is now greatly and suddenly relieved, and not unfrequently entirely removed—tumours subside, and violent lunatics generally become and continue more composed. In pleurisy and pneumonia this effect is strikingly exemplified—greater relief being thus frequently obtained within one minute of approaching faintness, than perhaps twenty-four hours accomplish in any other way.

A great collapse of the arteries is visible throughout the whole system, as evinced by the cold and shrunk skin, by paleness, and by a correspondent relaxation of the sensible functions, in consequence of being partially deprived of the circulation of blood. If the effusion of blood be continued but a little further, and with rapidity, entire fainting comes on—though I have known a gradual stream of three, four, or eight ounces to flow while the patient continued in this state. Entire fainting, of course, occasions all the above symptoms to be carried to their fullest extent. Sickness, and frequently vomiting, occur at the same time with these phenomena, and complete a series of striking similarities to the effects of emetics, and particularly of antimony.

The relaxation I have just attempted to describe, is produced in very many instances by the loss of but a few additional ounces of blood, beyond the quantities usually

directed to be drawn. Thus a delicate female, from whom it is common to draw eight or ten ounces, will frequently become faint with the loss of twelve or fourteen. A man of a delicate city habit, from whom twelve ounces is frequently taken, would be apt to become sick with sixteen or seventeen. Large and powerful men, on the other hand, and under circumstances favourable to the preservation of self-command, will often bear the loss of twenty-five or thirty ounces.

The occurrence of this relaxation is much accelerated or retarded by many circumstances, several of which are in the control of the operator, and which he may direct accordingly. The causes which accelerate faintness are heat, confined air, an erect posture which drains the brain of its blood, and a discouraged and agitated mind. The reverse of all these produces the contrary effect—and these means can sometimes be used to great advantage, as for example, when we bleed in the warm bath to reduce a hernia.

On commencing to bleed, in Rush's depressed pulse, it rises with a gradual but more rapid progress—becoming larger, fuller, or more voluminous, and at the same time distinctly softer. This change is, I think, evidently owing to the arteries relaxing with more rapidity than the heart—and when it occurs the pulse is generally at first small and hard, though I have known the same phenomena in an artery, at once small and soft, or compressible. It is in this state of increased volume, after partial bleeding, that that great master of the knowledge of the pulse, Dr. Rush, teaches us that the inflammatory tendency is greatly augmented. My not having seen evidence of this, together with its discordance with the preceding reasoning upon the distending and injecting power, prepares me to suspect this opinion of being merely hypothetical. It is to be presumed that, unduly influenced by the hypothesis, he did not frequently put it to trial. After thus rising in volume, the pulse of which I speak falls fast, and when about the natural standard, I have generally closed the vein—leaving a slight disposition to faintness—but which in most instances was

accompanied and rewarded by a remarkable diminution in the violence of the symptoms.

I conceive then, finally, that the advantages of this relaxation, in different degrees and extent, are so great in comparison with any fears of debility, that in all decided inflammatory cases, in violent fevers, and even in some having a tendency to typhus—in all serious diseases affecting the sensorium, and in many venous congestions, it ought as a general rule to be produced in the first bleeding—and that the exceptions should be only incidental. In subsequent bleedings its use admits of many considerations, and should much more rarely be adopted. If fully tried in the first instance, an opportunity for the contraction of the inflamed vessels will have been afforded—and it is on account of its not having proved altogether sufficient to remove the disease that the repetition of it comes at all in question. It may very frequently admit of a doubt, whether the advantage would recompense the additional loss of blood—as we cannot expect as much relief in a second trial of it as was afforded by the first. Our principal consideration will then be of a *first* bleeding. Here we have, by the loss of a few additional ounces of blood, a full opportunity for the vessels of an inflamed or congested part to contract, as it is well known they will do, and unload themselves of blood, while the injecting force of the heart is suspended. Pain is immediately relieved, and nervous irritation and fever are diminished—in particular, the distressing febrile heat. As to debility, it can obtain but little permanent increase where four or five ounces of blood make all the difference—and I believe that this little is always abundantly recompensed by a diminished necessity for subsequent bleeding, and by a diminution of the exhaustion which would have been produced in the progress of the disease. The *present* debility is completely relieved by quiet in bed, and is generally an extremely soothing and satisfactory state.

In strong and large persons, and in full inflammatory cases, the removal of a large quantity of blood is more commonly expected—and a few ounces more or less, are

less attended to. Here we are left more at liberty by common opinion. I believe the same reasoning will hold good.

On the other hand, in very weak patients, in those having any degree of tendency to typhus, or in excessively violent and malignant diseases, it is matter of notoriety that a much smaller loss of blood can be borne, consistently even with the preservation of life itself. In these instances it has been frequently concluded, that no blood at all should be drawn, in consequence of its being observed that the patients faint with the loss of a very little. The very diversified opinions of practitioners on the utility of bleeding, certainly allow me the liberty of choice on this point—and the abovementioned general diminution of deaths from typhous fevers since the introduction of bleeding, confirm the practice. I believe then, that in many cases of fever, having a tendency to typhus at its close, the small quantity of blood which suffices to produce a feeling of faintness, should be drawn—that in some of them this will diminish the typhus tendency, and that the physician should retain the privilege of bleeding, according to circumstances, in his hands, without yielding to any unqualified proscription whatever.

It is very common to draw blood by cups, from patients in this condition—under the impression that it is better borne in this way, than by taking it from the arm. I have paid particular attention to ascertain this point—and have come to the conclusion that in cases of this kind, (meaning to include yellow fever,) bleeding by cups or leeches was just as exhausting and debilitating as bleeding from the arm. I could not discover that a patient was any longer in fainting in the one instance than in the other—as the little advantage gained by abstracting blood from the small vessels, over taking it from the same circulation, through a larger one, was fully counterbalanced by the pain and fatigue of cupping. I have frequently known patients to faint from cups and leeches. It is no such rare occurrence, when any thing approaching to the same quantity of blood is drawn.

While thus expressing opinions relative to the proper employment of blood-letting, it is requisite to add, that I do not consider myself as inculcating a copious use of this agent, but as urging a freedom from prejudice and general proscription, and a constant recurrence to first principles. The opinions of physicians are so extremely liable to misconception on this point, and to be made the foundation of such injurious popular impressions, that an explanation of this kind is absolutely necessary.

At the same time that bleeding to relaxation of the arteries is stated to be such a powerful remedial means, it must be constantly borne in mind that it is a very serious one. It is neither more nor less than an approach to the state of death, and places the degree of vitality which the patient shall retain entirely at the mercy of the physician. He should therefore treat it as a Herculean medicine should be treated—held in reverence as a means of preserving life, but not to be practised in a careless manner on trifling occasions.

Those who indulge these pages with a perusal will probably ask, what is the object or general conclusion at which I have aimed, in thus recapitulating the circumstances by which we familiarly judge of blood-letting? It is by attempting a just estimate of all these considerations, to arouse all our minds to a compendious grasp of the whole state of the question—and to induce physicians to avoid all general rules for particular diseases, all universal commendations, and all absolute prohibitions, and to judge of each case solely by its own merits. The use of a remedy which possesses such a powerful control over the whole system, and can totally revolutionize it with so much ease—of so principal an edge-tool in the treatment of diseases—is always to be at the command of every qualified practitioner, and free from prohibitions and denunciations—while at the same time, the physician must consider that he may be almost said to incur, a second time, the whole awful responsibility of undertaking his momentous profession, combined and concentrated in the use of this single remedy.

Art. IX. *An Attempt to account for the origin of the belief in the "Uncommon Subtlety," and "Fascinating Faculty," generally ascribed to the Serpent.* By Richard Povall, M. D. of Philadelphia.

In the most ancient, as well as in some of the more modern histories, we read of the superior subtlety of the *Serpent.* Moses, in his account of the creation of the world, speaks of him as being "more subtle than any beast of the field which the *Lord God* had made"—and the *Saviour* of mankind, when delivering his instructive precepts to his disciples, said to them, "Be ye as wise as serpents, and harmless as doves."

We are informed on the respectable authority of Strabo and Eusebius, that at Elephantina, the God who is supposed to have been the architect of the universe, is worshipped under the figure of a serpent. In the mythology of some of the heathen nations it is not very uncommon for the serpent to be represented as the symbol of the sun, by having his body formed into a circle, and his tail in his mouth, thereby indicating, as they imagined, the course of that luminary: and under this form he was also considered an emblem of eternity. He was the symbol of Apollo and Esculapius, who presided over the sanative art, and as such was the object of adoration. In the orgies of Bacchus, the persons who participated in the ceremony carried serpents in their hands, and with horrid yells would cry out *Eva! Eva!* which according to a learned philologist, signifies a serpent. The Chaldeans were much addicted to the worship of the serpent, and from them the practice passed into Egypt, where he was looked upon as very sacred. According to the authority of the learned Mr. Bryant, traces of serpent worship have been discovered among the Hyperboreans, at Rhodes, in Phrygia, and upon the Hellespont, in the island of Cypress, in Crete, among the Athenians, among the na-

tives of Thebes, in Bœotia, among the Lacedemonians, in Italy, and in Syria.

The questions now very naturally occur, whence arose these ideas of his transcendent subtlety, and all this celebrity? And why have so many different nations paid him divine honours? It is my present purpose to offer some conjectures upon these points.

Whatever living being exerts a commanding influence over another, is most certainly entitled to the character of superior wisdom. Man triumphs over all other sublunary creatures, (though many of them surpass him infinitely in physical powers,) from no other cause than his higher intellectual gifts. Thus the ancients, having seen that the serpent was endued with the mysterious power of subduing other beasts of the field, and doubtless in some instances exerting, as we have witnessed in these our times, a similar influence over even the *lord* of the creation, it is not so wonderful or unaccountable that they should ascribe to him superior subtlety or wisdom. Unenlightened by a single ray of science, they did not examine the subject with philosophical scrutiny, in order to ascertain whether the power they saw exercised was the result of some specific intention of the agent, thereby giving it the true character of wisdom. They witnessed the fact, and with minds under the dominion of superstitious credulity, that was sufficient to induce them to believe that he was, of all others, the most subtle beast of the field—and the high character thus assigned to him soon secured him still more exalted honors. He was deified and worshipped.

In explaining, upon what I conceive true philosophical principles, the singular powers which have given the serpent the reputation of sagacity above all other beasts, I shall reject the commonly received opinion that they are dependent upon a *fascinating faculty*. I shall endeavour to shew:

First—That certain odours affect some individuals of our species in the most extraordinary manner.

Second—That many of the serpent tribe emit an effluvium of the most sickening and intolerable property: and

Third—That this effluvium, by parity of reasoning, is adequate to account for the occasional instances of those effects witnessed in man, and in some of the inferior beings who happen to fall within the sphere of its action.

1.—The odour of the rose, which is pleasant and vivifying to most persons, has been known in some instances to produce syncope. There is a lady resident in this city, who cannot endure it for a moment without such an effect. I have seen, myself, a gentleman lose the power of volition, and ultimately faint, in consequence of smelling that peculiar odour which is emitted from the bodies of negroes. Professional duty often called this gentleman to a near approach of persons of this description—and he assured me, whenever his olfactories were assailed with that most disagreeable appendage of the African race, he invariably lost the power of voluntary motion, and on several occasions, swooned from excessive sickness. It is a fact familiar to every attentive observer of passing events, that the smell of carrion will sometimes excite violent nausea and vomiting, and as a consequence induce considerable diminution of the powers of voluntary motion. There are many instances of certain drugs derived from the animal, vegetable, and mineral kingdoms, causing like effects. An intelligent druggist of this city informed me, that he once witnessed an instance of fainting, occasioned by the odour arising from musk—and the experienced physician has often seen violent nausea induced by certain gases, and by the odour of asafœtida, jalap, ipecacuanha, rhubarb, &c.

2.—About ten years ago, in the month of August, I was on a visit at the Sweet Springs in the state of Virginia, and whilst there was informed that within a mile or two of that place was to be seen a den of rattle-snakes. Moved by that curiosity so natural to an inquisitive mind, I determined to go to the spot, and see if they dwelt in such a state of society as was reported. Accordingly the necessary preparation was made, and being accompanied by a friend, I repaired to the den. I did not long remain unsatisfied of the verity of what I had heard. The raising a few large stones,

presented to our astonished and terrified view at least one hundred of those dangerous inhabitants of the mountainous regions of that country, and in less than five minutes we were so sickened by the intensely fœtid odour emanating from the snakes, that it was with difficulty we could extricate ourselves from the danger that surrounded us. I retched violently—was near fainting, and was indebted to the assistance of my friend for safety. Mr. William Bartram assured the late Professor Barton, in a written note, that the boiquira or rattle-snake, and some other species of serpents, do emit a very subtle odour, and that it has been known to agitate horses at the distance of thirty or forty yards. Frienshemius, a writer of Roman history, tells us that the army of Regulus, in its passage across the river Bugrada, in Africa, encountered a huge serpent, whose pestilential effluvium, proceeding from his breath, sickened and destroyed a number of the soldiers. I have frequently heard the farm negroes in Virginia speak of the black snake, the coluber constrictor of Linnæus, as emitting a very rank effluvium—and it is well known that this species of the serpent race are most adroit in taking birds, rabbits, squirrels, rats, mice, and many of the smaller reptile family.

3.—In our researches after truth, well established facts should always exert their wholesome sway. If we consider, then, the foregoing facts, with due candour and attention, they will afford us, I think, abundant reason to believe that the serpent has not the faculty of fascinating or enchanting either man or the lower orders of animals—but that he is indebted for his success in taking his prey and vanquishing his enemies, to that loathsome and sickening vapour which is thrown out either from the pores of his body, or with his breath. And he who has had opportunities of witnessing the great prostration of muscular power from excessive nausea, or of exhaustion of sensorial power by animal effluvia, exhibited by the contagion of typhus, needs no elaborate argument to convince him, that the want of ability to escape, in many instances, when beset by a serpent,

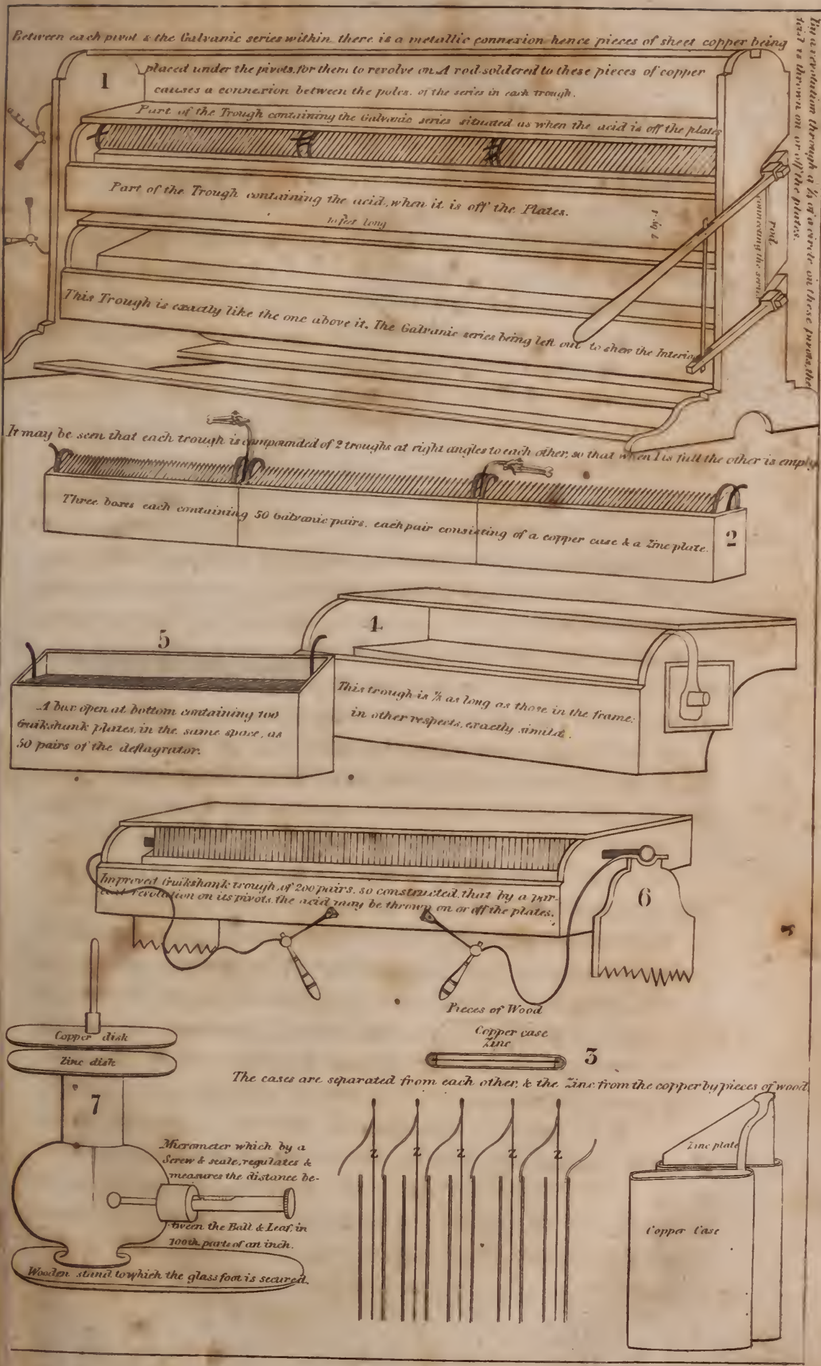
is owing to inordinate muscular relaxation, arising from the nauseating or debilitating effects of his mephitic odour.

Since embodying these observations, I have seen a memoir on the fascinating faculty of the rattle-snake and other American serpents, by the late Professor Barton, and learn from it that the celebrated naturalist M. de la Cepede, had attempted to "explain the miraculous power attributed to the serpent," somewhat as I have done. He "supposes that the rattle-snake's infectious breath, by agitating and inducing a kind of asphyxia in the animals which it means to devour, may prevent their escape." Professor Barton combats this opinion with much earnestness, but in my view unsuccessfully. He considers the true solution of the question to be had in the fact of the serpent's attacking the young animals, and the old ones in their attempts to defend their offspring, falling victims to their affection. There are other naturalists who have supposed the whole mystery might be explained by referring it to the powerful effects of "sudden surprise and terror." I am disposed to admit that this is sometimes the case—for excessive fright often induces such a prostration of muscular power as to suspend locomotion,* but this concession should not affect the solution I have attempted to give the question, because *nausea, exhaustion of sensorial power, and fear*, as proximate causes, exert the same relaxing effects upon the muscular system. Nor should it, for the same reason, be considered as admitting more causes than are necessary to explain the phenomenon.

* Madame Campan, in her Memoirs of Marie Antoinette, informs us that during the French Revolution, when the mob at Paris attacked the Thuilleries, and a dreadful massacre ensued, she called out to a heyduke of the Queen's to fly. The man said to her, "I cannot—I am dying of fear." p. 273.

ART. X. *Letter from* ROBERT HARE, M. D. *Professor of Chemistry in the University of Pennsylvania, to* B. SILLIMAN, *Professor of Chemistry in Yale College—on some improved forms of the Galvanic Deflagrator—on the superiority of its deflagrating power: also, an account of an improved Single Leaf Electrometer—of the combustion of Iron by a jet of Sulphur, in Vapour—and of an easy mode of imitating native Chalybeate Waters.*—Republished with corrections and additions, from Silliman's Journal, No. 1. Vol. VII.

AFTER I had discovered that the deflagrating power, of a series of galvanic pairs, was surprisingly increased, by their simultaneous exposure, after due repose, to the acid, various modes suggested themselves of accomplishing this object. In the apparatus which I sent you, the coils being all suspended to two beams, could be lowered into troughs containing the acid. In another apparatus, of which I afterwards gave you an account, with an engraving for your Journal, the troughs containing the acid were made to rise, so that all the plates might be immersed at once. A better mode has since occurred to me. Two troughs are joined lengthwise, edge to edge, so that when the sides of the one are vertical, those of the other must be horizontal. Hence, by a partial revolution of the two troughs thus united, upon pivots which support them at the ends, any fluid which may be in one trough must flow into the other, and reversing the motion, must flow back again. The galvanic series being placed in one of the troughs, the acid in the other, by a movement such as above described, the plates may all be instantaneously subjected to the acid or relieved from it. The pivots are made of iron, coated with brass or copper, as less liable to oxidizement. A metallic communication is made between the coating of the pivots, and the galvanic series within. In order to produce a connexion between one recipient of this description and another, it is only necessary to allow a pivot of each trough to revolve on pieces of sheet copper, severally soldered to the different ends of


Between each pivot & the Galvanic series within there is a metallic connexion hence pieces of sheet copper being placed under the pivots for them to revolve on A rod soldered to these pieces of copper causes a connexion between the poles of the series in each trough.
1
Part of the Trough containing the Galvanic series situated as when the acid is off the plates
Part of the Trough containing the acid, when it is off the Plates.
10 feet long
By a revolution through a ¼ of a circle on these pivots, the acid is thrown on or off the plates.
Rod connecting the series
This Trough is exactly like the one above it. The Galvanic series being left out to shew the Interior
It may be seen that each trough is compounded of 2 troughs at right angles to each other, so that when 1 is full the other is empty
Three boxes each containing 50 Galvanic pairs, each pair consisting of a copper case & a Zinc plate.
2
5
A box open at bottom containing 100 Cruikshank plates, in the same space, as 50 pairs of the deflagrator.
4
This trough is ⅓ as long as those in the frame; in other respects, exactly similar.
Improved Cruikshank trough, of 200 pairs, so constructed, that by a part revolution on its pivots, the acid may be thrown on or off the plates.
6
Pieces of Wood
Copper case
Zinc
3
The cases are separated from each other, & the Zinc from the copper by pieces of wood
Copper disk
Zinc disk
7
Micrometer which by a Screw & scale, regulates & measures the distance between the Ball & Leaf, in 100th parts of an inch.
Wooden stand to which the glass foot is secured.
Z
Z
Z
Z
Z
Zinc plate
Copper Case

a rod of metal. To connect with the termination of the series the leaden rods, (to which are soldered the vices or spring forceps, for holding the substances to be exposed to the deflagrating power,) one end of each of the lead rods is soldered to a piece of sheet copper. The pieces of copper thus soldered to the lead rods, are then to be duly placed under the pivots, which are of course to be connected with the terminations of the series. The last mentioned connexion is conveniently made by means of straps of copper, severally soldered to the pivots and the poles of the series, and screwed together by a hand-vice.

Fig. 1, (*see plate*) represents an apparatus consisting of two troughs, each ten feet long, constructed in the manner which I have described. Each trough is designed to contain one hundred and fifty galvanic pairs. The galvanic series in the upper trough is situated as when not subjected to the acid. In the representation of the lower trough the galvanic series is omitted, in order that the interior may be better understood. The series belonging to this trough may be observed below it in three boxes, each containing fifty pairs, fig. 2. In placing these boxes in the trough, some space is left between them and that side of the trough on which the acid enters, so that instead of flowing over them it may run down outside, and rise up within them.

The pairs of the series consist of copper cases, about seven inches long by three inches wide, and half an inch thick—each containing a plate of zinc, equidistant from its sides, and prevented from touching it by grooved strips of wood. Each plate of zinc is soldered to the next case of copper on one side. This may be understood from the diagram, fig. 3. It must be observed, that the copper cases are open only at the bottom and top. They are separated from each other by very thin veneers of wood.

Fig. 4, represents a smaller trough, differing from the others only in length. This I made with a view to some experiments on the comparative power of the galvanic pairs of the form of copper cases, with zinc plates, above

described, and those made on Cruickshank's plan, or of the form used by Sir H. Davy in the porcelain troughs.

Fig. 5, represents a box containing one hundred Cruickshank plates, (each consisting of a plate of zinc and copper soldered face to face) and slid into grooves, at a quarter of an inch distance from each other—all the copper surfaces being in one direction, and all the zinc surfaces in the other. In this case the zinc plates are exposed only on one side. The sum of the surfaces on which the acid can act, is therefore the same as in a deflagrator of fifty pairs, in which each zinc plate is assailable on both sides. It ought to be understood, that the box containing the one hundred Cruickshank plates is open at bottom, and is of such dimensions as to occupy the place of a box containing fifty pairs of the deflagrator, receiving the acid in its interstices from below in the same manner, by a partial revolution of the trough fig. 4.

Fig. 6, represents a box containing two hundred Cruickshank plates. This differs from the common Cruickshank trough, only in having the interstices as narrow as those between the copper and zinc surfaces of the deflagrator pairs, represented by fig. 2—and in the mode in which the acid is thrown off or on the whole series, which does not differ materially from that described in the instance of fig. 1.

On contrasting the series of fifty, (fig. 4) with Cruickshank's plates in the box, (fig. 5) the deflagrating power of the latter was found comparatively feeble—and even when compared with the Cruickshank trough, (fig. 6) in igniting metals, or carbon, the fifty pairs (fig. 4) were found greatly superior. The shock from the Cruickshank trough was more severe. You must recollect that in former experiments I found that galvanic plates, with their edges exposed as they are in the porcelain troughs used by Sir Humphrey Davy, were almost inefficient when used without insulation; as are the pairs of the deflagrator. This demonstrates that an unaccountable difference is producible in galvanic apparatus by changes of form or position.

Being accustomed to associate the idea of the zinc pole,

in a Voltaic series, with the end terminated by zinc, and the copper pole with the end terminated by copper, I was surprised to find that in decomposing water, the oxygen was attracted by the wire connected with the copper end of my deflagrator, while the hydrogen went to the wire connected with the zinc end. Subsequently, however, it occurred to me, that in the deflagrator the zinc pole is terminated by copper, the copper pole by zinc—and hence the apparent anomaly that oxygen appears to be attracted by copper, and hydrogen to be attracted by zinc.

The projection from the carbon, exposed between the poles, takes place at the negative pole of the pile, and not at the positive pole, as you have alleged—and thus your observation that the current of igneous matter is from the copper to the zinc, may be reconciled with the Franklinian theory.

The observations which are the subject of this communication, combined with those which you have made of the incapacity of the deflagrator and Voltaic series in the usual form, to act, when in combination with each other, must justify us in considering the former as a galvanic instrument, having great and peculiar powers.

Since the above was written, I have tried my series of three hundred pairs. The projectile power and the shock were proportionally great, but the deflagrating power was not increased in proportion. The light was so intense, that falling on some adjacent buildings, it had the appearance of sunshine. Having had another series of three hundred pairs made for Dr. Macnevin, of New York, on trying it I connected it with mine, both collaterally and consecutively, so as to make, in the one case, a series of six hundred—in the other, a series half that in number, but equal in extent of surfaces. The shock of the two, consecutively, was apparently doubly as severe as the shock produced by one—but the other phenomena seemed to me nearly equally brilliant, in either way.

The white globules which you noticed, were formed copiously on the ignited plumbago, especially in vacuo. I have not had leisure to test them, being arduously occupied in

my course of lectures, and in some efforts to improve the means of experimental illustration.

Account of an Electrometer with a single leaf, by which the electricity excited by the touch of heterogeneous metals is rendered obvious after a single contact.

Fig. 7, represents an Electrometer, with a single leaf suspended from a disk of zinc, six inches in diameter, which constitutes the top of the instrument. Opposite to this single leaf is a ball supported on a wire, which may be made to approach the leaf, or recede from it, by means of a screw. Above the instrument is seen a disk of copper, with a glass handle.* The electricity produced by the contact of copper and zinc, is rendered sensible in the following manner. Place the disk of copper on the disk of zinc, (which forms the canopy of the electrometer:) take the micrometer screw in one hand, touch the copper disk with the other, and then lift this disk from the zinc. As soon as the separation is effected, the gold leaf will strike the ball, usually, if the one be not more than $\frac{5}{100}$ of an inch apart from the other.† Ten contacts of the same disks of copper and zinc, will be found necessary to produce a sensible divergency in the leaves of the condensing electrometer. That the phenomenon arises from the dissimilarity of the metals, is easily shewn by repeating the experiment with a zinc disk, in lieu of a disk of copper. The separation of the homogeneous disks, will not be found to produce any contact between the leaf and ball. I believe no mode has been heretofore contrived, by which the electrical excitement resulting from the contact of heterogeneous metals, may be detected by an electroscope, without the aid of a condenser. It is probable that the sensibility of this instrument is dependent on that property of electri-

* For the experiment with this electrometer a metallic handle would answer. Its being of glass enabled me to compare the indication thus obtained, with that obtained by a condenser.

† I have seen it strike at the distance of a quarter of an inch. Twelve pairs of copper and zinc, seven inches by three, separated by dry paper, caused the leaf to strike the ball.

city which causes any surcharge of it, which may be created in a conducting surface, to seek an exit at the most projecting termination or point connected with the surface. This disposition is no doubt rendered greater by the proximity of the ball, which increases the capacity of the gold leaf to receive the surcharge, in the same manner as the uninsulated disk of a condenser influences the electrical capacity of the insulated disk in its neighbourhood. It must not be expected that the phenomenon above described can be produced in weather unfavourable to electricity. Under favourable circumstances I have produced it, by means of a smaller electrometer, of which the disks are only two and a half inches in diameter.*

The construction as respects the leaf and the ball, regulated by the micrometer screw, remaining the same—the cap of a condensing electrometer and its disks, may be substituted for the zinc disk.†

On the Combustion of Iron by a jet of Sulphur, in Vapour.

If a gun barrel be heated red hot at the butt end, and a piece of sulphur be thrown into it—on closing the mouth with a cork; or blowing into it, a jet of ignited sulphurous vapour will proceed from the touch-hole. Exposed to this a bunch of iron wire will burn, as if ignited in oxygen gas, and will fall down in the form of fused globules in the state of proto-sulphuret. Hydrate of potash exposed to the jet, fuses into a sulphuret of a fine red colour.

An easy mode of impregnating Water with Iron.

If a few pieces of silver coin be alternated with pieces

* I think I have seen an effect from a disk only an inch in diameter, or from a zinc disk having a copper socket to its handle.

† Mr. Wallenstein, the Russian Secretary of Legation, after seeing mine, had an electrometer of this kind made, in which one disk of the condenser is of zinc, the other of copper—so as to answer the purpose either of a condenser, or of shewing the electricity produced by heterogeneous metals. When used as a condenser, the disks are not made actually to touch, and of course act as if homogeneous.

of sheet iron, on placing the pile in water, it soon acquires a chalybeate taste, and a yellowish hue, and in twenty-four hours flocks of oxide of iron appear. Hence by replenishing with water, a vessel in which such a pile is placed after each drought, we may have a competent substitute for a chalybeate spring.

Clean copper plates alternating with iron, would answer—or a clean copper wire entwined on an iron rod—but as the copper when oxidated yields an oxide, it is safer to employ silver.

Art. XI. *Practical Observations on Ergot.* Read before the Pittsburgh Medical Society, January, 1824. By Dr. William Church.

THIS singular substance is the product of a disease called *clavus*, affecting rye growing in low and moist situations.* Its colour, says Vauquelin, is externally violet, internally white. Its figure is cylindrical—the extremities being more or less tapering, and curved in form of a crescent, having a furrow on the convex as well as the concave side. At first it is without smell, but after some time acquires one which is acrid and disagreeable. A grain cut transversely and viewed under a microscope, appears to be composed of white brilliant grains resembling those of starch. The coloured pellicle which covers it, exhibits, when examined in the same manner, a violet coloured mass, with minute whitish specks scattered through it. The ergot is most abundant in wet seasons.

This substance was empirically used in France, and in some parts of this country,† half a century ago. It was

* It seems rather to be owing to the peculiarities of season or climate. We are told by a friend that he has seen it extensively diffused over the richest fields of rye in Lancaster county, Penn. in the highest as well as in the low grounds.—Editor.

† Especially among the German settlers in Pennsylvania.

prescribed and found useful in cases similar to those in which it is now so beneficially exhibited.

In the year 1774, Madame Dupill stated, "that from her infancy she has known it to possess one quality," (that of accelerating lingering labour). "which has not been followed by any bad consequences." She gave it in doses of a thimble-ful, very finely powdered, in a table-spoonful of water, wine, or weak broth, and looked for its effects in a quarter of an hour. She gave it only when the presentation was natural and the labour lingering.*

This medicine was first introduced into regular practice by Dr. John Stearns, of Saratoga county, New York, who highly extolled it for its power of accelerating labours. The correctness of his statements have been fully confirmed and exemplified by subsequent observers. He says that "it expedites lingering labour, and saves to the accoucheur considerable time." The cases in which he found the ergot useful, were when the pains were lingering or had wholly subsided, or were incompetent to the expulsion of the fœtus. It is of the highest importance to defer the exhibition of the ergot until the labour be considerably advanced, and the *os uteri* in a complete state of relaxation. "For obvious reasons (says Dr. Thacher in his Dispensatory, p. 338) it is proper to be cautious in employing this powerful parturient, in cases of preternatural presentation."

On the 11th January, 1820, while I was attending to an obstetric case, in Ross township, Alleghany county, Penn. a respectable female informed me that about forty years ago the midwives of this country were in the habit of giving *blasted rye* tea, (meaning a decoction of ergot) to their patients. They gave it for the purpose of quickening the pains of labour, to make them bear down, and thereby accelerate the birth of the child. When asked what were its effects, her answer was "that in some cases it did a great deal of good, and in others it did a great deal of harm. Where every thing was right, and the pains were weak and

* Ecl. Rep. Vol. IX. p. 262.

inefficient, it quickly caused them to bear down, and the child was generally born in less than an hour after the tea had been given." . The cases in which it did harm were those of preternatural presentation, and where the external parts were rigid. In these cases, she stated "that the women generally became delirious or hysterical, and continued in that situation about an hour or two," when I suppose it had ceased to affect the system—and "the midwives observing its prejudicial effects in some cases, were induced to lay it aside, especially as the women were unwilling to employ those who used it." She had heard nothing of this medicine during the last twenty years. From this statement we learn that a valuable medicine may fall into disuse merely from the ignorance of those who administer it. That midwives have been, and still are, wofully ignorant, (*docti indoctique*) is unfortunately proverbial.

In the form of powder I give it in doses of from ten to sixty grains. Sometimes it is more active in the form of decoction—two drachms of the powder being gently boiled in half a pint of water for ten minutes, strain, and give one third of it every twenty minutes, until proper pains shall have commenced, after which I give no more.

"The phenomena consequent upon a dose of ergot," says Dr. Malachi Foot, "in those cases" of labour "in which it is indicated, will generally be found as follows: After a lapse of six or eight minutes the patient begins to manifest an augmented sensibilty to her burthen—her mind becomes more irritable, and she discovers constant and sudden impatience. She becomes restless—complains of her position, and distorts her body. She peevishly remonstrates at the indifference and neglect of her attendants, and in the rapidity of her ideas seems to have acquired a new estimate of time. Her pains increase in force and frequency, and in most cases suffer but small intermissions until delivery.* Upon the exhibition of a larger dose, or where it has been improperly administered, other symptoms super-

* New York Medical Repository, second series, vol. ii. page 273.

vene, such as nausea and vomiting. Her eyes look wild—her expressions are incoherent—and in some cases slight delirium supervenes. Sometimes she is very irritable and peevish—scolds, laughs, and cries alternately. A person who knew nothing about her case, on seeing her would conclude that she was labouring under hysteria."

Dr. Prescot gave a drachm of it to a man. He says that "it was inert, and that the larger dose of two drachms was equally so." The reason is obvious—the man was destitute of that viscus through whose medium the general system could be affected. "But," adds the Doctor, "in every case of amenorrhœa in which I gave it a trial, it caused pain in the region of the uterus, nausea, and vomiting."* Dr. Atlee says that in one case it produced "slight hysteria."† Every physician knows the great influence which the uterus exerts over the nervous system—and also when that viscus is in a diseased state, the patient will be generally more or less affected with hysterical symptoms. Hence I infer that those symptoms of hysteria enumerated above, supervening in consequence of the exhibition of the ergot, *incontrovertibly prove, that it does exert a specific action over the uterus.*

I would lay it down as a general rule to be observed in the exhibition of the ergot, that in all cases where there is a great rigidity of the muscular fibre, it is inadmissible—and that where blood-letting is indicated, the ergot is altogether improper.

Dr. Stearns very justly observes that "it is impossible to predict the injuries it may produce in the hands of the ignorant and unskilful:"‡ with equal propriety you might place a naked sword into the hands of a madman. "But if properly administered," says Dr. Prescot, "it must be esteemed an invaluable acquisition to our materia medica."

I have used this medicine—1st, In amenorrhœa—2d, In lingering and laborious parturition—3d, In labour complicated with uterine hemorrhage—4th, Where the placenta

* Eclectic Repertory, vol. iv. page 154.

† American Medical Recorder, vol iv. page 143.

‡ Eclectic Repertory, vol. viii. page 228.

has been retained from an atonic state of the uterus—5th, In retention of the placenta caused by, or accompanied with an hour-glass contraction of the uterus—6th, In adhesion of the placenta—7th, As a preventive in cases where the patient has formerly suffered much from flooding, consequent to the birth of the child and extraction of the placenta—8th, In cases of uterine hemorrhage subsequent to delivery.

CASE 1.—*Of Amenorrhœa.*—In the month of September, 1816, Miss S—, aged twenty-three, of a leucophlegmatic temperament, applied to me and stated her case to be as follows—that in the month of April preceding she had a suppression of the menses in consequence of cold, since when she had no return of her courses. She complained of a pain in her breast and dry cough—her bowels were in a torpid state, and she was much emaciated, weak and languid—her pulse was preternaturally slow, but a little excited in the evening.

She had employed all the usual remedies for the disease. I first gave an emetic, followed by a brisk cathartic, in order to evacuate the primæ viæ. I then, to obviate costiveness, directed two pills, made of equal parts of aloes and myrrh, to be taken every night at bed-time, and also advised two table-spoonfuls of the decoction of ergot—to be taken three times a day. She persevered in the use of the above remedies about one month, when her catamenia returned, and she became regular. The cause being removed, all her phthisical symptoms disappeared. She continued to enjoy good health until the summer of 1817, when she removed, and I have not heard from her since.

CASE 2.—*Labour rendered lingering by a weak and inefficient action of the uterus.*—On the 19th of April, 1818, I was called to visit Mrs. S—, who had been in labour with her first child thirty-six hours. She had been bled to the extent of thirty ounces—laxative clysters had been administered, which had operated well—her pulse was about seventy, and soft. The pains were feeble and inefficient—presentation natural—os uteri fully dilated—and the exter-

nal parts quite relaxed. I gave her one drachm of powdered ergot, and washed it down with a cup of hyson tea. In ten minutes after, the pains became more frequent and forcible—the membranes ruptured the twenty-third minute, from which time there was a continued action of the uterus, until the thirty-sixth and a half minute, when I delivered her of a living female child. At the fifty-second minute the placenta came away. She recovered rapidly.

CASE 3.—*Protracted labour.*—On the 25th of April, 1821, I was called to visit Mrs. G—, who had been in labour with her fifth child, forty-eight or fifty hours, during which time she had been attended by a midwife. I arrived about ten A. M. and learned that she had been twice bled—had an evacuation from the bowels that morning—made water frequently, and that she was much exhausted and discouraged. The waters had been discharged twelve hours—the *os uteri* was considerably dilated—the external parts were but little relaxed, and the child's head was situated high up in the pelvis—her pulse was rather full and hard—and I understood that about sunrise she had been attacked with rigours, faint spells and vomiting, symptoms which indicated the death of the child. I took twenty ounces of blood from her arm, then gave one drachm of powdered ergot—half an hour after, the pains became more frequent and forcible—in another hour the ergot appeared to have exhausted its effects upon the system, and the throes of labour consequently became weaker;* I then repeated the dose, which soon caused them to become very frequent and forcible, and the head began to descend. Two hours and a half after the exhibition of the first dose she was delivered of a dead male child, and recovered rapidly. It may be proper to observe that this woman always had lingering and difficult labour, and that three of her five children were still born.

* Dr. Prescot very justly observes, that the action of the ergot will continue, if the delivery is not effected for an hour or more—and when it subsides, the medicine again given will reproduce the same effects.—Eclectic Repertory, vol. iv. page 251.

Case 4.—*Laborious parturition caused by a slight deformity of the pelvis, with malposition of the child's head.*—On the 30th of January, 1819, I was called to visit Mrs. C—, who was in labour with her tenth child, and had been attended by an intelligent midwife, two nights, one whole day, and part of the second day. The midwife had her bled twice, and had given a dose of salts, which operated well. The waters had been discharged fourteen hours, since when the action of the uterus was comparatively suspended. Upon examination *per vaginam*, I found the *os uteri* fully dilated, external parts quite relaxed, and that there was a slight deformity of the pelvis, in the short or *antero posterior diameter*. The head of the child was situated high up in the pelvis, and as well as I could ascertain, the presentation was the fourth of Baudeloque, in which "the anterior fontanelle answers to the left acetabulum, and the posterior to the right sacro iliac symphisis," which Dr. Burns calls "malposition of the head."* She was very restless and impatient, and requested me to deliver her immediately with instruments—observing at the same time that she was not afraid of them, as she had been twice delivered by their use. I bled her to the extent of sixteen ounces, gave one drachm of ergot, which produced no sensible effect for half an hour, when I repeated the dose—after which, in a few minutes the uterus began to act. As the pains of labour appeared to have no effect on the head, after waiting another hour, I gave the third drachm, after which they became a little more effective. After waiting another hour, the pains not being as frequent and as forcible as I wished, and not having the effect of causing the head to descend so that I could reach it with the vectis, I gave the fourth dose—after which, in a few minutes, the contraction of the uterus became strong and forcible, and the head began to descend. My patient became delirious, and would every few minutes exclaim, "Doctor, the powders you gave me have made me quite crazy." In about an hour after the exhibition of the fourth

* James Burns, vol. ii. pages 2 and 54.

dose of the ergot, the head had descended so low, that I without much difficulty reached it with the lever, and changed its preternatural presentation to a natural one—having effected this, the child was expelled by the natural pains in twenty-two minutes. It was small and dead. She recovered in about two weeks. Owing to the deformity of the pelvis, she had been twice delivered by chephalotomy—and I with pleasure add, that after a labour of thirty-six hours she has since borne a small living child.

I have used the ergot in several similar cases, which I think it unnecessary to detail.

Case 5.—*Labour complicated with uterine hemorrhage, caused by an attachment of the placenta to the cervix and os uteri.*—On the 4th of August, 1819, Mrs. R—, aged thirty-six, being in the eighth month of her seventh pregnancy, fatigued herself very much by carrying a heavy burthen from market, the day being excessively hot, and the distance about the fourth of a mile. In the evening she sent for me and complained of short cutting pains in her back, which recurred at intervals, and sometimes extended to her sides, resembling the throes of labour. She also complained of a violent pain in her head, was very restless, and her nervous system considerably agitated—her pulse being full and hard, I drew sixteen ounces of blood from her arm, and gave an anodyne. When I visited her in the morning I found her better. As her bowels were in a constipated state, I gave an ounce of epsom salts, which operated well, and at bed-time administered a grain of opium.

Nothing worth relating occurred until the night of the 17th, when I was requested to see Mrs. R—, who was dying. I went up hastily, and judge of my surprise, when on entering the room, I saw my patient literally weltering in her own blood, and in a state approaching to syncope! After recovering a little, she told me that she went to bed in her usual health, and slept comfortably—upon waking and turning herself in bed, she felt something within her womb break loose with a *loud crack*, and instantly profuse hemorrhage supervened. I immediately made an examination, but was unable to ascertain the state of the *os uteri* by

my finger—concluding that it was impossible to introduce my hand for that purpose, I rested satisfied with plugging the *vagina* with cloths wrung out of cold vinegar and water, and directed a powder composed of one-fourth of a grain of opium, the same of ipecacuanha, and two grains of sugar of lead, to be taken every hour, dissolved in half a gill of cold water—ordered her to be kept very cool and quiet—cold vinegar and water for drink—and cloths wrung out of cold water to be kept constantly applied to the abdomen and pubes. I staid with her two hours, when by the constant use of the above remedies the flooding moderated.

Notwithstanding the diligent and persevering use of all the remedies for restraining uterine hemorrhage that could be devised, she continued to flood every few hours, and was sinking rapidly, and on the 25th I thought it adviseable to call in a consulting physician. At my request Dr. Lewis very politely attended. Upon mature deliberation we concluded that it was absolutely necessary, in order that our patient might have a chance for her life, to give ergot, to excite the uterus to contract and expel its burthen, as we were convinced that the hemorrhage was caused by a partial detachment of the placenta. I remained with her all night, during which time I gave half an ounce of ergot. About half an hour after she had taken the first portion she complained of a pain in her back, extending sometimes to her sides, which recurred at intervals during the night. Soon after contractions of the uterus came on, the flooding ceased. In the morning I made an examination, and found the *os uteri* dilated to the size of a cent, with something protruded a little at one side, which I afterwards found to be the placenta. She continued much in the same state until ten P. M. of the 26th, when the pains, which had been weak and infrequent, became frequent and effective. Upon examination I found the breech presented, and from this time I kept constant pressure during the pains, with the fore and middle fingers of my right hand, on that part of the placenta which was protruded, until the breech came through the mouth of the uterus and was about to protrude

the *os externum.* Half past two in the morning of the 27th I delivered her of a living male child. The placenta followed instantly. No hemorrhage supervened, and on examination the uterus was found well contracted above the pubes. An anodyne was now given, and a compress secured over the uterus by a broad bandage pinned moderately tight round the abdomen. By the aid of wine, bark, elixir of vitriol, &c. she recovered perfectly in about six weeks or two months. She could not inform me of the time when the membranes ruptured.

Case 6.—*Labour complicated with uterine hemorrhage, caused by an attachment of the placenta over the os uteri.*— About two A. M. on the 16th of March, 1822, I was requested to come as fast as possible to see Mrs. M. who was in labour, and dying. On entering the room I had the pleasure of meeting with my friend Dr. Gazzam, and was informed by him that this was Mrs. M.'s seventh labour—that she had discharges of blood from the uterus at intervals during the whole period of utero gestation—and that three weeks ago she had a fall, since when there had been a constant draining of blood from the womb—and that about two hours previous she felt a pain in her back, which induced her mother to send for the midwife who had formerly attended her. The midwife accordingly came, and declared that by "a common examination she could feel nothing, that *the flooding was not of any consequence*—that she would lay down and take a nap, and that if Mrs. M.'s labour came on they must awaken her." Providentially, however, notwithstanding the opinion of the midwife to the contrary, Mrs. M.'s mother thought her to be in imminent danger and therefore sent for Dr. Gazzam. The Doctor upon examination, found the whole body of the placenta presenting and partly protruding the *os uteri*, and by passing his hand anterior to it, ascertained that the head and arm presented, which he immediately pushed up, and searched for the feet in order to deliver by turning. Presently he found a foot, which he brought down. The whole time that he was thus engaged, the hemorrhage was very

profuse—and the widwife who was still in the house became very clamorous, and insisted she had seen many worse cases, and that the doctor ought not to interfere, but leave it to nature. By this time pulsation ceased at the wrist—she was covered with a cold clammy sweat—and was apparently dying when the doctor sent a messenger for me. A few minutes before my arrival he gave her thirty grains of powdered ergot. As my friend was fatigued, he requested me to deliver Mrs. M. Upon examination I found matters precisely in the state they were represented—and with considerable difficulty brought down the other foot. By this time pulsation had again ceased at the wrist, and she was again apparently dying—we now gave her sixty grains of powdered ergot, and every minute or two gave her a table-spoonful of rum and water. In about fifteen minutes after the exhibition of the last dose of the ergot, we had the extreme pleasure of observing that it caused the uterus to contract—after waiting half an hour I delivered her of a dead child. The placenta instantly followed. Not the slightest hemorrhage supervened, and the uterus was well contracted above the pubes.

She recovered so very rapidly, that on the fourth day she sat up an hour in bed—when her attendant very imprudently scrubbed her room, and gave her improper food, of which she ate heartily—in consequence of which, violent puerperal fever supervened, of which she was relieved by the usual remedies in about two weeks, and recovered perfectly in about six. She has since enjoyed good health.

In these cases the beneficial effects of the ergot were most conspicuous.

Case 7.—*Of labour complicated with uterine hemorrhage.* —On the 9th of October I was called to visit Mrs. M—, who was in the ninth month of her first pregnancy. On my arrival I was told that she had just fallen down stairs, and was much hurt. She was greatly agitated, and observed that the fall had killed her child—for at the moment of the fall, she felt it bound violently for a few moments, and then cease with a tremulous motion. She had a con-

siderable discharge of blood from the uterus—I had her put to bed, and drew twenty ounces of blood from her arm, gave sixty drops of laudanum, ordered cold vinegar and water for drink, and directed her to be kept very cool and quiet. On the morning of the 10th, I found her in a state of great despondency. The membranes had ruptured sometime in the night, and the waters were coming from her every few minutes mixed with blood. I directed the vagina to be plugged with cloths wrung out of cold vinegar and water, and cloths wetted with the same, to be kept constantly applied to the abdomen and pubes—gave an anodyne, and enjoined absolute rest in a recumbent posture. She continued much in the same situation until nine P. M. of the 11th, when contrary to my positive orders, she arose from her bed to have it made, and sat in a chair—profuse hemorrhage supervened. She was then carried to bed, and I was sent for in great haste. On my arrival I found her pale and fainting, and her friends very apprehensive for her safety. I, for the first time, made an examination, and found the *os uteri* considerably dilated, the external parts quite relaxed, and the breech presenting. I then gave her sixty grains of ergot. After which, in ten minutes, she began to complain of pains in her back, extending to her sides, &c. which increased in force and frequency until half past eleven, when I delivered her of a dead male child. The placenta came away immediately, and she had a good recovery. On the 19th of the next October, I delivered her of a fine daughter.

Case 8.—*Labour complicated with uterine hemorrhage.*—On the 25th of May, 1821, Mrs. T—, being at the full period of utero gestation, fell over something in the yard, and was immediately seized with chills, sickness at stomach, accompanied with small discharges of blood from the uterus—in which state she continued all night. At day-break on the 26th I was sent for. Upon my arrival I found her very much alarmed, and apprehensive for her safety. She had slight pains in the region of the uterus, with small discharges of blood. As her pulse was full and

tense, I bled her, gave an anodyne to allay the nervous irritability of the system, directed her to be kept very cool and quiet, cold vinegar and water for drink, and rest in a recumbent posture. She continued much in the same situation until about two A. M. of the 27th, when the discharges of blood became more copious and frequent. I then directed the vagina to be plugged, and cloths wrung out of cold water, to be kept constantly applied to the abdomen, which moderated the flooding. At ten A. M. she was taken in labour, the pains were weak and infrequent. At one P. M. I made an examination, and found the *os uteri* dilated, the external parts relaxed, and the head presenting at the brim of the pelvis—I then gave her one drachm of ergot, from which time her pains increased in force and frequency until forty-two minutes past three, when she was delived of a dead male child—the placenta followed in a few minutes, and she had a good recovery.

Dr. Dewees advises the ergot to be given in cases "where the placenta has been prevented from being thrown off." Whoever follows this advice in all cases, will sometimes be disappointed, and will attribute his want of success to the inefficiency of the medicine, and it will thereby causelessly fall into disrepute, an event which I am very desirous of preventing.

I have used the ergot in cases where the placenta was retained from an atonic state of the uterus, with the best results.

In two cases of retention of the placenta, caused or accompanied by an hour-glass contraction of the uterus, in which I exhibited the ergot, it *did harm* by augmenting the distress of the patients, and rendering all attempts to dilate the stricture abortive. In these cases I had to wait until the effects of the medicine ceased, then dilate the stricture and deliver the placenta in the usual way. Both patients did well.

Case 9.—*Adherent placenta, with rupture of the funis, and hour-glass contraction of the uterus.*—On the 1st of June, 1818, Mrs. D— was, after a labour perfectly natural,

delivered of her first child, which was still born. The funis being putrid, and twice wound round the child's neck, was ruptured just as the shoulders were about to be delivered. After waiting half an hour I wished to introduce my hand to deliver the placenta, but she would not consent. As the case appeared favourable for the exhibition of the ergot, I resolved to give it a trial, and gave sixty grains, which not producing much uterine action, in an hour I repeated the dose—after which sickness and sharp uterine pains soon succeeded, but without any effect on the placenta—for by a common examination I could ascertain nothing. After waiting five hours longer, the effects of the ergot having for some time ceased, I mentioned to my patient that it was now absolutely necessary for me to introduce my hand and extract the placenta, when she consented. On passing my hand into the uterus, I found it contracted like an hour-glass. I then dilated the stricture, and in passing my hand through it, found the placenta adherent to part of the body and *fundus uteri*, which I very cautiously and with considerable difficulty detached and extracted. No hemorrhage supervened, and she had a good recovery.

From these cases we learn the absolute necessity, in order to guide to a successful mode of practice, that the practitioner should, if possible, ascertain the precise state of the uterus and placenta before he administers the ergot.

I have given it as a preventive of hemorrhage to several women, who formerly suffered much from flooding consequent to the birth of the child and expulsion of the placenta. I gave it generally in doses of thirty grains, ten or fifteen minutes preceding the probable delivery of the child: it prevented flooding in all cases. Dr. Stearns says, "that this probably results from the contractile power which the ergot has excited in the uterus previous to delivery, and which is subsequently continued till that viscus is reduced, and the bleeding vessels nearly closed."*

Case 10.—*Uterine hemorrhage, subsequent to delivery.*—On the 11th of February, 1820, after a very severe labour

* Eclectic Repertory, vol. viii. page 228.

of twenty hours, I delivered Mrs. C— of her first child. At the forty-second minute the placenta was excluded. Nothing unusual occurred until the 15th, when hemorrhage supervened, for which I directed the usual remedies, which moderated it. Notwithstanding the diligent and persevering use of the most approved antihemorrhagic remedies, she continued to flood at intervals until the morning of the 17th, when the flooding became very profuse. She was in a state of syncope when I saw her, and on consultation with Dr. Gazzam it was agreed to give ergot. As her abdomen was large and flaccid, and the uterine tumour not perceptible, it appeared evident that the flooding was caused by a torpor of the uterus, which prevented it from contracting, and thereby closing the mouths of the bleeding vessels. We therefore directed ten grains of pulverized ergot, to be taken every hour until the flooding ceased. Fifteen minutes after she had taken the second powder, the uterus began to contract, in consequence of which the flooding moderated, and ceased entirely by the time she had taken the fourth dose. She recovered perfectly in about three weeks.

I have been very particular in observing whether the death of the child has in any case been caused by the ergot. In case second, it was born alive and vigorous. In case fifth, it was born alive under the most unfavourable circumstances, notwithstanding half an ounce of ergot had been taken by the mother. In another case it was very large, alive and vigorous. In case third, the patient very reasonably supposed her child was dead six hours before she took ergot—as she had symptoms which indicated its death at sunrise that morning. In case fourth, it is evident that the deformity of the pelvis, with the malposition of the head, and consequent laborious labour, were causes sufficient to produce its death. In case sixth, the delivery by turning caused its death. In case seventh, it was evidently killed by a fall down stairs. In case eighth, the patient immediately after her fall was seized with chills, sickness at stomach, and discharges of blood from the uterus. It is probable that the child, in this case, was killed by the fall. I have not observed

that the ergot in any case caused the death of the child. I could always find other causes amply sufficient to procure its death. I have no doubt that if given in cases where there is great rigidity of muscular fibre, before the labour is advanced, when the *os uteri* is undilated, the external parts unrelaxed, and where blood-letting has not been premised, that the powerful and continued efforts of the uterus caused by the ergot, will prevent the retreat of the child's head after it has advanced within the bones, and that the unceasing pressure may in some instances occasion its death.

From the preceding cases it is obvious, that the exhibition of the ergot increases the uterine action when weakened, or renews it when suspended.

My experience authorises me to say, that its effects are as uniform as those of tartar emetic, calomel, jalap, opium, or ipecacuanha—and that prescribed in proper and well selected cases, it will as seldom fail or disappoint the prescriber.

Dr. Dewees advises the ergot to be given in cases where "the head of the child has been separated from its body, and left within the uterus."* Whoever adheres to this advice in all cases will be most wofully disappointed, and the consequences resulting therefrom will in some instances be fatal. Hence the absolute necessity of the practitioner's discriminating and judging for himself before he gives the ergot.

This unfortunate accident may occur where the uterus and child's head are in three different states, each of which will unquestionably require a different mode of treatment.

It may occur, first, where the uterus is in an atonic state, and the child's head of a natural size. In this case the ergot is indicated, and its exhibition will be crowned with success.

Second, where the head is of a preternatural size, from hydrocephalus, or other causes. Exhibited in this case, the powerful contractions of the uterus pressing on the head of the child, which from its preternatural size cannot pass

* American Medical Recorder, vol. ii. p. 205.

through the pelvis, may, and probably will, occasion inflammation or rupture of the uterus, and consequently destroy the patient. In this case it will be proper to diminish the size of the head, when it may be extracted by the hand or blunt hook.

Third, where this action is accompanied by an hour-glass contraction of the uterus. Exhibited in this case—by causing the *fundus uteri* to press unceasingly on the child's head, which is prevented by the stricture from passing through the uterus and pelvis, it may cause rupture or inflammation of that organ, and thereby destroy the patient. In this case I would give an anodyne clyster, next dilate the stricture in the usual way, and then the head may be extracted by the hand or blunt hook. I have been called to but one case of this kind. I extracted the head with the blunt hook. The patient recovered in about three weeks. I have heard of two similar cases which occurred in this part of the world—one near Meadville, in the year 1809—and the other in the vicinity of this city, in the year 1814. I am sorry to say they both terminated fatally.

I have lately read Dr. Ramsbotham's truly valuable work, and am much surprised that he *condemns* the ergot *without* having given it a *fair trial.* Dr. Dewees very justly observes, that Dr. R's. doubts would be instantly removed, as soon as he witnessed the exhibition of this substance.

In Dr. Ramsbotham's Chapter, on *Relaxation of the Uterus*, he observes, "I am disposed to suspect, (yet I must be allowed to observe that it is mere suspicion, for I have not been able to obtain positive evidence of the fact,) that it was an insidious case of this dangerous kind, which bereft Great Britain of an amiable and beloved princess, the pride of her sex and the ornament of her country. I will suppose that the eminent accoucheur employed on that occasion, upon the expulsion of the head after such a tedious labour, not observing the usual signs of life, in his great anxiety to save, if possible, a babe of such value, to use the speedy means of resuscitation, and of restoring suspended

animation from pressure, used some extractile force to hasten delivery in the absence of uterine action." He supposes that "the uterus was so much debilitated by its previous exertion, that after the expulsion of the placenta, it did not contract so as to close the mouths of the bleeding vessels, and that consequently the fatal internal hemorrhage supervened."

All this is *very likely*. I would just remark, that if such had been the case, it is more than probable that a drachm of ergot, exhibited about half an hour previous to the birth of the child, would have increased the uterine action, and saved Sir Richard Croft from using "*extractile force*," prevented relaxation of the womb, and consequent internal hemorrhage, and thereby saved *the life* of that illustrious and universally lamented personage.*

* In cases of natural labour, where there is no better reason for exhibiting the ergot, than a slight delay of the placenta, we cannot but think the exhibition of it reprehensible. The introduction of the hand in a proper manner, is in almost every instance sufficient to provoke the contractions of the womb, and the patient suffers nothing after the placenta is removed. Where ergot is indiscriminately employed, the contractions of the uterus are rendered unnecessarily violent, and the danger of puerperal fever is increased by the effects of this poison continuing after the removal of the difficulty. Nothing has been more prejudicial to the true interests of medicine, than the universal employment of particular agents. We hope that the ergot will not be thus used, as it must of necessity produce much evil, and will sink into unmerited neglect.

[The above note has been added by an intelligent practitioner, by whom the proof sheet of Dr. Church's Essay was read.]—*Editor.*

Art. XII. *A brief account of some Electro-magnectic and Galvanic Experiments.* By Robert Hare, M. D. Professor of Chemistry in the University of Pennsylvania.

Seven hundred feet of copper wire, nearly as thick as a knitting needle, were made to encircle the columns of the Lecture Room. One end of the wire was connected with one end of a large calorimotor—the other, terminated in a cup of mercury—into this, a wire proceeding from the other pole of the calorimotor was introduced. Under these circumstances, a magnetic needle placed near the middle of the circuit, was powerfully affected—and when the circuit was first interrupted, and then re-established by removing the wire from the cup, and introducing it again, the influence appeared to reach the needle as quickly as if the circuit had not exceeded seven inches in extent. The needle being allowed to become stationary in the meridian, while the circuit was interrupted, and the end of the wire being then returned into the mercury, the deviation of the needle, and the contact of the wire with the metal, appeared perfectly simultaneous.

A wire was made to circulate with great rapidity, by means of two wheels, about which it passed like a band. The wheels being metallic, and severally connected with the different poles of a calorimotor, it was found that the motion neither accelerated nor retarded the galvanic influence—and it made no difference whether the needle was placed near the portion of the wire which moved from the positive pole to the negative, or the portion which moved in the opposite direction.

If a jet of mercury, in communication with one pole of a very large calorimotor, is made to fall on the poles of a horse-shoe magnet communicating with the other, the metallic stream will be curved outwards or inwards, accordingly as one or the other side of the magnet may be exposed to the jet—or as the pole communicating with the mercury may be positive or negative. When the jet of mercury is

made to fall just within the interstice, formed by a series of horse-shoe magnets mounted together in the usual way, the stream will be bent in the direction of the interstice, and inwards or outwards, accordingly as the sides of the magnet, or the communication with the galvanic poles, may be exchanged. This result is analogous to those obtained by Messrs. Barlow and Marsh, with wires, or wheels.

It is well known that a galvanic pair, which will, on immersion in an acid, intensely ignite a wire connecting the zinc and copper surfaces, will cease to do so after the acid has acted on the pair for some moments—and that ignition cannot be reproduced by the same apparatus, without a temporary removal from the exciting fluid.

I have ascertained that this recovery of igniting power does not take place—if, during the removal from the acid, the galvanic surfaces be surrounded either by hydrogen gas, nitric oxide gas, or carbonic acid gas. When surrounded by chlorine, or by oxygen gas, the surfaces regain their igniting power, in nearly the same time as when exposed to the air.

The magnetic needle is, nevertheless, much more powerfully affected by the galvanic circuit, when the plates have been allowed repose, whether it take place in the air or in any of the gases above mentioned.

I have not as yet had time, agreeably to my intention, to examine the effect of other gases, or of a vacuum.

Art. XIII. *Observations on the Mortality of Philadelphia for* 1823. By G. Emerson, M. D.

THE unusual disparity which appears between the number of deaths for the last year in the cities of New York and Philadelphia, induced me to examine with attention the reports of interments, in order to investigate the cause. The whole number of deaths reported, amounts to three thousand four hundred and forty-four in New York, and

four thousand six hundred in Philadelphia. The total for Boston during the same period, is stated at one thousand one hundred and fifty-four, so that the interments in Philadelphia for the last year, rather exceed those of New York and Boston added together.

The following table exhibits a comparative view of those diseases which have proved most fatal in the two principal cities, and will be found to shed considerable light upon the subject.

	New York.	Philadelphia.	New York. Totals.	Philadelphia. Totals.
Fevers, viz:				
Typhus,	89	243		
Bilious and Remittent,	80	253		
Intermittent,	14	60		
Simple,		165		
Inflammatory,	2		192	758
Hectic,		3		
Scarlet,	2	11		
Puerperal,	3	23		
Malignant,	1			
Yellow,	1			
Inflammations, viz:				
Lungs or Chest,	181	142		
Bowels, Stomach and Peritoneum,	88	106		
Liver,	31	37	350	338
Brain,	47	46		
Bladder, Kidney and Uterus,	3	5		
Dropsy,	141	81		
of the Head,	144	147	291	275
Breast,	33	47		
Bowel Affections, viz:				
Cholera,	177	265		
Diarrhœa,	64	110	339	562
Dysentery,	98	187		
Consumption,			683	536
Croup or Hives,			94	67
Convulsions,			202	214
Measles,			117	156
Tabes Mesenterica,			93	44
Hooping-cough,			31	74
Small-Pox,			18	160

Those who examine this statement, will be forcibly struck with the surprising difference presented under the

head of *fevers*, the fatality of which, in conjunction with that of bowel complaints, small-pox and hooping-cough, will nearly make up the excess in our bill of mortality. The average number of deaths by fevers estimated for the three years previous to 1820, is three hundred and thirty-five.

We may therefore fairly ascribe most of the increase of mortality in Philadelphia for the last year, to the unusual, and we trust, transient prevalence of small-pox, but more particularly to an unhealthy condition of the atmosphere in its vicinity, which during the summer and autumnal months has proved a prolific source of fevers and bowel complaints.

It may appear paradoxical to some, but still I believe myself safe in declaring, that the city proper has for the last three years been unusually healthy, and particularly free from those diseases which the bill of mortality represents as most fatal. To explain this apparent contradiction, it is necessary to observe, that the country about Philadelphia, and even the suburbs, have for about three years past, experienced a degree of sickness during the summer and fall months, hitherto unknown—the salubrity of the city remaining all the time unimpaired. Indeed it is highly curious to observe how accurately the incroachments of the sickly air have been limited by the pavements, and very few persons have been affected with what has received the name of *country fever*, who have kept within their bounds.

With the view of ascertaining what proportion of interments belonged to the city proper, the Board of Health issued circulars to the physicians, requesting them to note in their certificates the districts in which their deceased patients had resided. This plan was adopted too late in the season, and its objects were not so satisfactorily attained as could have been desired. However, the result for a few weeks will shew that the proportion of interments was, as anticipated, less for the city than for the liberties and country.

The interments from

Aug. 9th to 16th	were 130	of which 53	were from the city.
16th to 23d	113	48	
23d to 30th	129	50	

Aug. 30th to Sept. 6th	112	of which 45	were from the city.
Sept. 6th to 13th	137	63	
13th to 20th	115	50	

It is proper to remark that most of the fever cases which terminated fatally in the city, originated in the country, and that the deaths at the public Alms House to which paupers are sent from all parts of the country, are included within the estimate for the city. The incorporated part of Philadelphia, which is four miles in extent from north to south, and two from east to west, contains a population of about one hundred and twenty thousand. The register of interments is made from the weekly returns furnished the Board of Health by the sextons of the different burying grounds, and includes both those from the city and country.

Next to fevers, consumption is the most mortal complaint on our list, but it appears to have been much less fatal in Philadelphia than in New York. The same remark will likewise apply to the inflammatory affections of the chest, to croup, and tabes mesenterica.

That there is no reason to believe any material difference exists as to the healthfulness of these two cities, under ordinary circumstances, fully appears from the ensuing table. The superiority, in this respect, is indeed rather in favour of Philadelphia.

A comparative view of the mortality from the most prevalent diseases in the cities of Philadelphia and New York, including a period of six years.

	PHILADELPHIA.				NEW YORK.			
	Fevers.	Bowel Affections.	Consumption.	Tot. per an. of all diseases.	Fevers.	Bowel Complaints.	Consumption.	Total per an. of all diseases.
1817	216	229	349	2217	227	116	574	2527
1818	496	283	396	2765	350	319	591	3265
1819	294	363	459	3124	292	444	577	3013
1820	565	454	446	3374	359	491	625	3515
1821	419	380	438	3172	341	319	715	3542
1822	510	451	488	3591	394	301	624	3231
	2500	2160	2576	18243	1963	1990	3706	19093

Lithotomy Forceps

J.R.Barton Del. C.G.Childs Sc.

ART. XIV. *Lithotomy Forceps.* Recommended by JOHN RHEA BARTON, M. D. Surgeon of the Pennsylvania Hospital, and Philadelphia Alms House Infirmary.

IT is not my desire to enlarge the modern *Armament. Chirurg.* by the addition of new instruments. On the contrary, I seize every favourable opportunity of simplifying or abridging it. A surgeon may contribute much to the improvement of his profession by this simple course. But when there is a palpable imperfection in any instrument, which he thinks he has corrected, it is his duty to communicate it.

Every lithotomist has experienced, or witnessed in others, considerable embarrassment in the extraction of a calculus. This difficulty often arises from the defective construction of the forceps. As commonly made, they are necessarily a clumsy instrument—for in order to apply the requisite degree of pressure against the handles to retain the stone within its grasp, it must be made proportionably thick and strong. Hence the bulk of stone and forceps blades, as they have to pass through the incision in the neck of the bladder, is perhaps, upon an average, double that of the stone itself—consequently, double the resistance is made to the extraction.

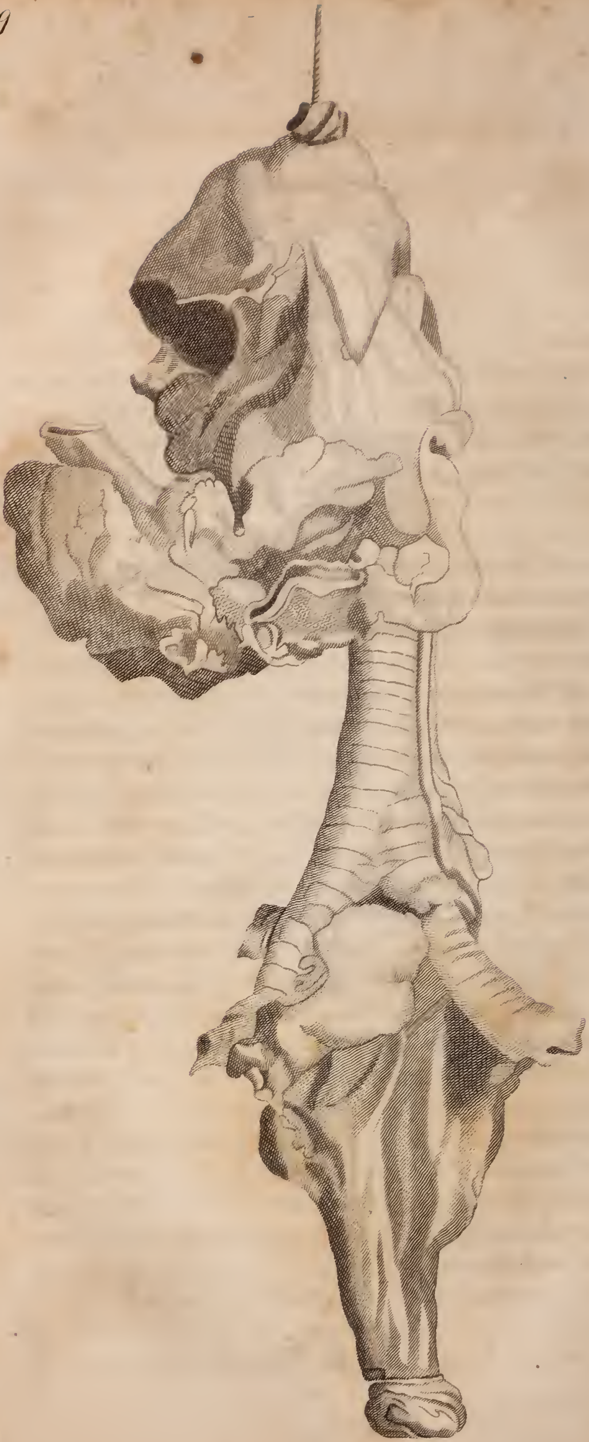
Another objection to the common forceps is, notwithstanding all care, the liability of the instrument to lose its hold, and the stone to slip back into the bladder, thereby greatly prolonging the patient's sufferings. These, with many other minor objections, I have found to be entirely overcome by having the forceps constructed as delineated in the accompanying plate. The instrument from which I made the drawing was only of that size, and has been employed by other hands than my own for the extraction of stones of considerable dimensions.

In explanation of the plate, it is only necessary to state that *the outline* is intended to represent a back view of the blades of the forceps, and the manner in which the stone falls into the vacuities in the blades, and then becomes immoveably fixed, scarcely having any additional bulk given to it by the instrument.

CASES.

Art. XV. *A Case of Habitual Vomiting, depending on the pressure of a Scirrhous Tumour upon the Œsophagus, &c.* Communicated by Abraham Stout, M. D. of Bethlehem, Pennsylvania.

G. H. aged fifty-two years, of regular habits, has been subject from infancy to occasional attacks of asthma—but after the age of puberty they were so slight that he seldom found it necessary to apply for medical aid. In 1815 he was severely afflicted with pleuritis in the left side, which, however, terminated in resolution by the usual treatment. After this he attended a mill—but frequently complained of a slight tightness across the chest, which he attributed to the effects of the dust, particularly that which arose from tobacco whilst grinding it for snuff. In the summer of 1821 he grew weak—his complexion sallow—loss of appetite—and in November he began to vomit after eating. As the disease advanced the vomiting occurred more frequently, and became gradually attended with nearly all the symptoms of dyspepsia—such as heart-burn, sour eructations, flatulency, gnawing in the stomach, uneasy constriction in the throat, a slight pain in the region of the liver, with a difficulty of lying on the left side, dyspepsia, cough, and an affection of his voice. In August 1822, a small indurated tumour made its appearance on the right side of the trachea, immediately above the clavicle. This tumour increased rapidly in size, extending upwards, and in a short time it acquired the size of a man's fist, on the side of the neck. Soon after the tumour was first discovered, the patient's stomach rejected every article of diet and drink—great weakness and palpitation of the heart ensued—the cough be-



R. G. Childs Sc.

N.B. For "natural size" in the text read two thirds of the actual size.

came very violent—breathing laborious—which continued until the fifth of the ensuing November, when the unfortunate sufferer expired.

Permission was obtained to open the body. The abdominal viscera were first inspected, all of which were found in a natural and healthy condition. After the thorax was opened, the breast and lungs were carefully examined, but no appearance of disease could be discovered in them, except an adhesion of the left lung to the pleura. This adhesion shewed no marks of recent inflammation, and was probably the result of the pleuritis which the patient had several years before his decease. In the superior mediastinum, and opposite the third, fourth and fifth dorsal vertebræ, a scirrhous tumour of considerable size was found, that nearly surrounded the œsophagus and bronchia. From this tumour a thin indurated cord extended upwards on the left side of the trachea, and formed the connecting medium between it and the larger tumour on the side of the neck. The œsophagus and bronchia were considerably contracted and inflamed, where they were enveloped by the scirrhous mass—but the inflammation extended only a very short distance beyond the parts that were mechanically acted upon by the tumour. The right carotid artery was much enlarged and diseased. (See the plate which represents the natural size and figure of the morbid parts.)

This case affords a striking illustration of one of those diseases in which the physician's pathological views are embarrassed by a chain of delusive symptoms. The loss of voice depended on the compression of the recurrent branches of the eighth pair of nerves, and the sympathetic affection which the scirrhous tumour produced on the stomach by its pressure on the œsophagus and par vagum, excited such strong indications of the disease being primarily seated in the stomach, that the principal medical treatment was directed towards that viscus.

Art. XVI. *Case of Poisoning with Opium successfully treated by Cold Affusions.* By Samuel Jackson, M. D.

A GIRL aged seventeen, residing in the vicinity of the Alms House, driven to despair by her hapless and abandoned condition, took the desperate resolution to terminate at once her existence and misfortunes. With this intention she swallowed, on the 31st March, two ounces of laudanum. Several hours subsequent, application was made at the Alms House for medical aid. Dr. Gwinner, one of the resident physicians, immediately attended to the case, and finding the unfortunate girl in a very dangerous state, had her removed into the house, and despatched a note to me requesting my assistance.

On my arrival the patient was perfectly insensible, and could not be roused from the profound coma into which she had sunk—the temperature of the skin was below the natural standard—the respiration slow and deep—the pulse slow, with rather less than natural force—the jaws were firmly fixed by the contraction of the muscles.

Dr. Gwinner had succeeded, by forcing open the mouth, in introducing into the stomach, at different intervals, ʒi sulphas zinci, gr. xv. antimon. tartar. and ʒi pulv. ipecacuanhæ, but without the slightest effect. He had also administered irritating injections, composed of aloes and jalap, but which had made no impression.

Having noticed in the London Medical Repository for the month of January last, which accidentally came into my hands a few days previous, that cold affusions had proved very successful in the treatment of poisoning by opium, I determined to give it a trial. I directed a quantity of cold water to be brought, and while the attendants held the head of the patient over a tub, I proceeded to dash on it forcibly the water from a small mug. The first affusions were not felt. The fourth occasioned a slight sobbing, which increased with each succeeding dash, until it augmented into

loud cries. In less than five minutes she was able to sit up, and was partly conscious of what was addressed to her—with very slight resistance her mouth was opened, and a feather forced into the fauces. Efforts to vomit were excited, but proved ineffectual.

The sensibility of the system not being completely restored, an injection of ℥ss. ol. terebinth. suspended in ℥iv mucilage, was thrown into the rectum, and a few more dashes of water were directed to the head. The affusions now occasioned great agitation, and in a few minutes nearly a complete restoration of consciousness. Half a drachm of ipecacuanha was mixed with some water, which she immediately took. In a few minutes vomiting was induced, and the stomach completely emptied of its contents.

The patient was conveyed into a bed, and warm bricks placed under the covering. Sinapisms were applied to the calves of the legs, and a cup of strong coffee directed to be given every hour.

During the night she repeatedly vomited, and occasionally would sink into a soporose state, but from which she was roused by the attendants. The next morning our patient was sufficiently recovered to dress herself, and accompany her friends home, who were induced to take her again under their protection.

The treatment of poisoning from opium by cold affusions is claimed, in the paragraph of the London Medical Repository I have alluded to, for Mr. Wray, and the editor, Dr. Copland. Reference is made to some letters published by them in June, 1822, in the same journal. Not having that work in my possession, I have not been able to ascertain the extent of their experience, but from the very marked and decided success that attended its employment in the preceding case, I am disposed to place great reliance on its efficacy. That the practice may be more extensively made known in this country, and additional trial be given to it, has induced me to give publicity to the above case.

REVIEWS.

Art. XVII. *Elements of Medical Jurisprudence.* By Theodric Romeyn Beck, M. D. Professor of the Institutes of Medicine, and Lecturer on Medical Jurisprudence in the College of Physicians, and Surgeon of the Western District of the State of New York, &c. &c. 2 vols. 8vo. Albany, 1824.

Medical Jurisprudence is a branch of professional education, which has lately received the attention merited by its high importance and indispensability, to the administration of justice—but from the eagerness with which it has been studied in various countries, and the number of persevering inquirers who have devoted themselves to its improvement, in comparatively a short time, it has reached a high degree of perfection. Italy, Germany and France, claim with propriety the honour of having first scientifically called on medicine to aid in the due application of law—England followed at a great distance, after the lapse of many years, and in a very humble manner, the steps of the Continental writers. Until a very recent period, the best English works on this interesting subject, were mere pamphlets or tracts on particular topics, some of the most approved of which, were confessedly imitations or translations of foreign essays. Their only extensive systematic work by Paris and Fonblanque, appeared very nearly at the same time with the work of Dr. Beck, and to judge by the eagerness with which the contents are extracted in the British Journals, and the generally indiscriminate praise bestowed on it, the science is as yet but very little known out of their great cities, and the foreign authors but little read, else the reviewers would not venture so directly, as well as by implication, to assert their originality and pre-eminence in juridical medicine.

It is not, however, to British Journals that we are to

look for candour or impartiality, in acknowledging their scientific obligations to Continental writers, especially the French. With the exception of the Edinburgh Medical and Surgical, and one or two of the London Journals, we could refer to a great many most hardy assumptions of originality in various particulars, which cannot fail to excite the pity and contempt of those who are aware of the source whence their plumes are borrowed. The comparatively few who receive the works appropriated, or who read the languages in which they are written, contribute to render this system of plagiarism so common and so little liable to detection. We shall not be surprised to see hereafter, a work especially devoted to an exhibition of their unjust appropriations, which will be the more amusing when contrasted with their high sounding claims to originality, and the dogmatically dictatorial spirit in which they deal out their opinions and censures.

We are led to make these remarks, from a conviction that there are too many of the profession in this country, who are unduly influenced by the decisions of writers, whose greatest claim to authority, is the accident of their appearance under a "London" title page—but when considered without reference to this adventitious circumstance, are really in very many instances possessed of no other merit, than a free declamatory style, and a moderate degree of arrogant assurance. In addition, we know that physicians in America are very little aware how much the journalists of Europe are actuated by party spirit, nor do they understand the system of literary brokerage which is so common, and exerts so powerful an influence over their criticisms and predilections. That there are highly honourable exceptions to such journalists and journals, we are fully aware and are happy to acknowledge. Yet we would urge on our professional brethren the propriety of never yielding their assent to mere *assertions*, destitute of experimental or argumentative support, whether emanating from the vast emporium of "London," or the more *classical* and authoritative city of Edinburgh.

Of the French, German, and English writers on medical jurisprudence, our author has given a catalogue in his first volume, which, although it does not contain the titles of *all* the works by the writers of the two former nations, is very full, and exhibits fair evidence of the vast disparity between the state of juridical medicine in England and on the Continent at different periods. It is not only in medical jurisprudence that the English are behind the French and Germans: in surgery they do not excel the French, nor are they comparable to them in experimental physiology: in anatomy they are far behind the Germans and Americans. In the last number of one of their journals the confession is made, that of anatomy as a science they know nothing*—by which is meant that they study anatomy solely as a qualification for admission to the practice of medicine and surgery. The same journal remarks that they had no translation of Bichat's Anatomie Générale, nor would it prove a book of general acceptance. In this country Bichat's works have long ago been translated, and are most extensively read throughout our country. In all of our large cities there are societies and lectureships devoted ardently to the extension of anatomical science, as the basis of comparative anatomy, of experimental physiology, and of juridical medicine.

The Elements of Medical Jurisprudence, by Dr. Beck, is a work we commend to our *American* readers, with equal pleasure and pride. It will not only sustain a comparison with its English predecessors, but with a celebrated work that appeared simultaneously in London. We do not pretend to claim for it an *equal* standing in every particular : there is neither so much *law* nor so much *misplaced erudition*—it is deficient in classical *quotations* to beautify the text, and in pages written to introduce and illustrate *quotations*—it contains no dissertations on college charters, nor flourishes, recommendatory and defensive.

We have no doubt that Dr. Beck's Elements will super-

* Anderson's Quarterly Journal, Jan. 1824.

sede the necessity of any *English* work in this country of a similar nature. The extent of his researches has enabled him to give the reader a fairly condensed abstract of the present state of medico-legal knowledge, and this abstract is offered in plain, manly and unpretending language, free from the deadly affectation, the mawkish pedantry, and most insufferably provoking efforts at pleasantry, which disgrace so many European scientific works.

In two octavo volumes, containing more than eight hundred pages, we have the essentials of the study—the elements or general principles by which the inquirer may perfect his own studies, and fit himself for enlarging the field of the science. The first volume contains the following chapters—first, feigned diseases—second, disqualifying diseases—third, impotence and sterility—fourth, doubtful sex—fifth, rape—sixth, pregnancy—seventh, delivery—eighth, infanticide—ninth, legitimacy—tenth, presumption of survivorship—eleventh, age and identity—twelfth, mental alienation.

The second volume contains, chapter first, persons found dead—second, wounds on the living body—third, poisons—fourth, mineral poisons—fifth, the same continued—sixth, vegetable poisons—seventh, animal poisons. All these heads are examined carefully and minutely: nor do we think that any one can peruse these volumes without receiving a great deal of pleasure from the number of highly interesting facts presented, at the same time that he is much instructed by the conclusions he makes, and the application he deduces therefrom.

We are averse to the presentation of what are commonly called *analyses*, but what are in reality merely garbled extracts from books, which should be perused to be fairly examined. Where there are facts related of interesting novelty, or doctrines proposed of high importance, then extracts ought to be made to support the reviewer's statements, or to justify his inferences. In the case of an elementary work like the one before us, there is an injustice done both to the reader and author, when detached parts are offered as

specimens of the true value of the whole. As we draw our conclusions from examining the whole book, and as we form our opinion of its excellence from all it contains, we refer our readers with confidence to the book itself, for the support of what we have expressed in its favour.

Instead of making extracts, we shall invite the attention of our readers to the high importance of the study of medical jurisprudence, convinced that it is only necessary that this should be properly perceived, to secure to this science the general cultivation it deserves.

The most noble office of the law is the protection of life and the security of property—of the one it is the guardian, by the punishments denounced against such as attempt the existence of their fellow creatures, at the instigation of passion or cruelty, and the other it secures by the restraints imposed on cupidity or violence. But there are a great many circumstances, which render it exceedingly difficult to decide on the true nature of certain offences, where innocence may be subjected to suspicion or ignominy, and injustice be done to the accused. There are cases in which the rights of individuals may be invaded or the business of the state be impeded by the simulation of injuries or disease. Madness may be imputed, to wrest from a sane man the possession of his goods—or it may be assumed to effect certain purposes. There are cases in which we are called on to establish the validity of a charge of that most abhorred crime, violation of a defenceless woman, and there are others, in which we must exert ourselves to detect depravity in attempting to fix this guilt on the innocent. In all such instances the importance of this science will be felt, because it is then that we shall discover how very difficult the decision is, even when we are best instructed in all the pre-requisites. In cases where the real or supposed action of poisons is to be established, we again see what dreadful effects may be produced by unqualified and hasty decisions. An examination of what our author has collected on this subject, will show that in many instances the guilty have been suffered to escape, and in some the

unoffending punished, for want of the necessary acquaintance with the science of medical jurisprudence.

However painful the task, the moral philosopher will find in this study, a vast field for the observation of human nature—of what degradation it is susceptible, and what motives may cause its debasement. He will see in one view, man in all his frailty, and scarcely exhibiting any evidence of possessing a capacity for good—while in others, he will be instructed and gratified by seeing how science and humanity interpose to shield the unoffending from injury, and to deliver the wicked up to severe and merited fate.

Dr. Beck's book is every way suited to diffuse a taste for the study of medical jurisprudence—and though it will supersede any other yet published, as an elementary treatise, we are sure that many of our countrymen will hereafter produce works in extension of this desirable knowledge. In the fulfilment of this anticipation, we believe that no one will more heartily rejoice than our author; and we sincerely hope that he will again in due time, present himself before the American profession, to receive their thanks for the honourable discharge of another highly useful and important task. ⊖

Art. XVIII. *Dissertations on Cynanche Trachealis, or Croup, and on the Functions of the extreme Capillary Vessels in health and disease—to which were awarded the Boylston Premiums for the years* 1820 *and* 1823. By William Sweetser, M. D. Fellow of the Massachusetts Medical Society. Boston, Cummings, Hilliard & Co. 1823. pp. 123.

It is our duty to notice American works in the medical sciences, and where they possess real merit, as in the present instance, to praise them. The above essays, however, though highly creditable to the author, are not of the class of works which will reward an analysis. They do not, that we are

aware, contain any additions to medical knowledge. We shall therefore make a few preliminary observations on their nature and character, and then, in imitation of very high authority, employ them as a hook on which to hang a statement of some of our ideas respecting the capillaries.

The first of these works is a neat compendium of what is known upon the American treatment of the above disease—a treatment to which most of the English have now acceded, though widely different from that still employed in France. We have no particular remark to pass upon his methodus medendi, which, in the main, is very judicious, except that we think he makes too unimportant an article of calomel. We suspect most of our northern friends of rather undervaluing this magnum dei donum. It is only in warm climates and prolonged summers that it comes into full play —though we are persuaded that, in a disease like croup, its utility is not regulated by parallels of latitude. The second essay, that on the capillaries, is little more than an abridgment from Bichat—the writer hazarding but little originality. As we conceive the just reputation of this extraordinary man to have engendered a too implicit confidence in his judgment, and to have rendered popular and imposing some of his errors, we shall take the more freedom in differing from him in a point or two on which we shall treat. It is never propitious to science when a high and well-earned reputation renders the medical public fearful of canvassing the opinions sheltered under its shadow. All the great geniuses who have methodized whole sciences, have occasionally done harm in this way. It is the alloy that is mixed with the sterling gold of their labours.

The pamphlet which is composed of these two essays, forms a very neat specimen of medical literature—the style and arrangement are good, and the mechanical execution elegant, though the language is by no means free from blunders. The author has kept free from the affectation of interlarding his sentences with a profuse and useless parade of references to authors, to which, as aiming at a Harvard prize, he stood in some temptation. He reads the French

works in translations. Much of his judgment in the choice of treatment appears to be taken from Professors Hosack and Jackson. He was certainly bound, as a young man, to employ the experience of those who possessed more than himself.

We now proceed to our observations on the capillaries. The subject is one upon which a large share of our medical principles are founded, and without a rational view of which, it is perhaps impossible to be a good physician. We use this strong phrase under certain qualifications. We are well aware that there are in this, as in many other points, facts, for the acquisition of which we may safely depend on a correct experience—and that this practical knowledge may be sufficient for a useful purpose, although not systematized, rendered consistent, and expressed in philosophical language. It can hardly be necessary, however, here to maintain the advantages of a scientific knowledge of a subject, over one gained empirically, from practice alone. There is not only that of consistency and preparation for unforeseen occasions, but a preference to science must also be drawn from the circumstance of the rarity and difficulty of obtaining a correct and ample experience. To judge with truth from experience, it is requisite that the results of a considerable practice should be combined. In fact, that of a single individual is rarely sufficient to form inferences of this nature—and maxims fitted to regulate our conduct in these respects must be the result of the observations of many. In order correctly to understand these, it is necessary, again, that the applier of them should himself meet with practical exemplifications of the case—as otherwise he cannot well distinguish the phenomena when he meets them. Those who teach the various branches of natural history, well know the necessity of frequently appealing to the senses—and nothing is thought to be completely taught, of which the pupil has not learned to judge from his own observations.

To some, the above may appear irrelevant—but on reflection, the practical physician will easily recognise the great

and intimate connexion of the capillaries with every form of disease, and he will then see that we have been practical in our selection of a subject.

A mind accustomed to contemplate the operations of the larger vessels, is hardly aware of the relative anatomical importance of the capillaries. The phenomena of the cardiac circulation affect such large collective masses of fluid, that we gain, insensibly, the habit of fancying this portion of the blood the greater part. On the other hand, if the whole of the blood be estimated, as it is, upon we know not what data, at twenty-five pounds, four or five is the largest allowance which we can make for the more conspicuous vessels, and the remainder must be of necessity contained in the capillaries, including the erectile tissues. Again: a man of full size weighs from one hundred and forty to two hundred and fifty pounds. Now if the body of such an individual be thoroughly dried, it is reduced to somewhere about forty—leaving a deficiency of one hundred to two hundred pounds. Bruce found a large part of a caravan in the desert between Sennaar and Egypt, who had been murdered by the Arabs, dried to an extremely small size. Now, how large a portion of the fluid matter thus removed by desiccation can be contained in the arteries and veins of an ordinary man? Every one will recollect the astonishingly small bulk to which the muscles of anatomical preparations are reduced by a thorough drying. Most of those made among us are not by any means so completely dried as they might be. There are some old preparations at the Pennsylvania Hospital, where the muscles of the arm look like coarse twine, and those of the abdomen like membranes. How large a portion of these fluids, including blood, is contained in capillary vessels, and how much is out of them and in the substance of the parts, it is perhaps impossible to say—but it is evident from what we have mentioned above, that both must be very large.

The system of capillaries are then to be considered, as it is by modern writers, the great reservoir of the body—the apparatus which contains the bulk alike of blood as of

the other fluids, and from which a small portion is constantly and rapidly removed by the larger vessels, soon to be returned with altered properties to another part of the same system from which it was first taken. That the capillary are really more important and necessary to the animal frame than the other vessels, is argued by Bichat, from their universal prevalence. In the lowest species of animals, and above all in vegetables, no great circulatory vessels are to be found—nevertheless the vital functions are performed with regularity and energy. An enormous amount of sap distends the vessels of trees, and yet, as is well known, there are no vessels in them corresponding to arteries or veins. Capillaries are, therefore, far more essential to life, and in suitable structures, sufficient to perform its functions without the aid of larger trunks.

The capillary system is divided, at first, into that of the general and that of the pulmonary circulation. The latter is so distinct in many respects from the other, that it must of necessity be considered separately. We therefore waive it here. The capillaries of the general system, then, are again divided into those which contain and convey red blood, and those which convey other fluids. As the functions of secretion and nutrition are performed in these vessels, and of course these different substances produced, separated from the blood, and collected or deposited in the proper receptacles, it is evident that these matters must, in their passage, be contained and transmitted by capillaries. But this is not all. There are various portions of the body, where, in the healthy state, red vessels are not seen. In the tendons, hair, cartilages, and most of the ligaments, nothing like an arterial or venous appearance is ever discoverable while healthy—though the functions of nutrition, absorption, &c. require the presence of a vascular system. It is stated by Bichat, that very fine injections frequently develop one.* He adds, that frequently inflammation injects them with blood. This certainly cannot be a very frequent occurrence with cartilages, as we have seen several of those

* Anat. Gen. 2, 476.

of inflamed joints, and examined them carefully with this view, but could never discover the slightest redness in them. In the hairs there is a capillary system which is capable of continuing their growth like vegetables, after the death of the animal to which they were attached. The instance of the plica polonica, in which the hair is said to bleed when cut, mentioned as an illustration by Bichat, is not so much to our purpose—as, according to Dr. Bateman, there is reason to suspect that in such a diseased state of the head, a bleeding from the irritated skin was mistaken for one from the hair—especially as this unique phenomenon is represented to have occurred in such disgusting and filthy patients, that it is probable a less close scrutiny was made than was requisite to establish such a case. It is sufficiently evident that capillaries are fully competent to perform nutrition, without the necessary condition of their conveying red blood.

The structure of these vessels has been an object of research—but it must be confessed, it is one on which we remain, and appear likely to continue, very much in the dark. Their minuteness prevents it from being directly ascertained from inspection—and of a consequence, we can only judge from reasoning, which, in investigations of nature, is a far less certain guide. It is probable that it resembles, in most respects, the arteries and veins. From the circumstance of the same membrane being found lining the heart, the arteries and the veins, and from its evident uses, it is fairly to be presumed that it extends to, or is replaced by something similar in the minuter tubes of the circulation. From the fact of the extreme liability to ossification in the lining membrane of the arteries of men advanced in life, and from nothing similar having been detected in the minuter vessels, the conjecture is hazarded by Bichat, that the membrane in them is of a distinct nature. We do not see the force of this—as ossifications occurring in the capillaries must of course be so small as to be with difficulty discoverable. Again, ossifications generally occur where there is room for them: for instance, in the large arteries—and as this author himself remarks, convert them into a kind of

jointed tube, possessing considerable powers of motion, and sufficient, as is well known, for the performance of the office of the part. The interstices between the most thickly set of them, are many times greater than the diameter of the largest capillary. In vessels which, like the capillaries, must be capable, as we shall hereafter state, of entirely closing their cavities by contraction, such a structure is inadmissible—as the presence of plates of bone would effectually prevent such an operation. As we see these substances then, deposited only where they do not materially interfere with motion, what right have we to infer the existence of a different membrane in the minute vessels, from our not being able to detect them there? We therefore take a lining membrane similar to that of the arteries, to be rendered as probable as the nature of the case will admit.

It was believed by John Hunter that the vital contractile power of the arteries, which he considered muscular, prevailed in the capillaries to the exclusion of the ordinary elastic substance—and this he argued from the capacity which these vessels possess of closing their cavities by spontaneous contraction. It is sufficiently evident that they must possess it in a degree exceeding that of the larger vessels, which do not exert this faculty, unless under extraordinary circumstances, and to a very limited extent. The capillaries, which in their natural state contain blood, are capable of contracting so as to expel the least drop of it from their cavities, as in the effects of cold. Whether the capillaries also possess the elastic substance, is a question which, from the difficulty of obtaining evidence, is probably destined long to remain among the mysteries of nature. That they have a cellular coat there is no doubt, as every other substance in the animal body possesses one—and we have thus enumerated the coats which are usually considered as composing an artery. It is, we think, obvious that the sanguineous capillaries possess most of the attributes of arteries, and are closely analogous to them in functions.

While treating of the capillaries, there have been included the erectile tissues—which have been supposed by

some to be cellular, and to communicate with the arteries. The best and most authoritative opinion on the structure of these substances appears to be that of Beclârd, that the cavities in them partake of the nature of veins. Persons accustomed to anatomical pursuits, will recollect that when the cavernous substance of the penis is injected with coarse wax, the matter of injection returns by the great veins on the back of that body. The erectile tissues enumerated, are the cavernous and the spongy bodies of the penis, the clitoris, the nymphæ and the nipple—in all of which, a great collection of blood, disturbed, and perhaps altogether arrested in its progress, produces the erection and turgescence of the part. It has been also supposed, that the deep red appearance of the lips is produced by a structure approaching to this in its nature—although this is commonly attributed to their dense muscular structure, and to the transparency of the epithelium which covers them. These particular parts, however, differ so essentially from the ordinary capillary system, that it is necessary to give them a separate consideration—and in fact, they are not properly a part of our subject.

When we view the functions in which capillary vessels are employed, we find them various—circulation, nutrition, secretion, absorption. Of consequence, it is evident, that we must look for a difference in structure, and no single set of characters can apply to them all. Of circulation, as the leading function, we shall first treat, and then say a few words of the two next. Of absorption, although the tubes in which it commences are certainly capillary, we shall say nothing, as it differs materially from the others.

The mode in which the blood is made to move through these vessels, has been the subject of much discussion. The older physicians, since the time of Harvey, believed that it was simply impelled by the heart. The successive impulses of that organ propagated through an extensive system of elastic tubes progressively diminishing to an extreme tenuity, and thus increasing the friction to an immense amount, are naturally sufficient in the mind, to ac-

count for the slow, progressive and unvarying motion exhibited by these vessels, and continued by them to the veins. They possess, as we shall proceed to say, vital properties—and these have of late been much dwelt upon—but whatever their vitality may be, if designed for the transmission of a fluid, they are still tubes, and retain all the mechanical qualities of such. That mode of philosophising is a very defective one, which, when the word vitality is mentioned, or when it is said that a part is governed by vital laws, imagines that it is completely removed from the influence of physical causes. It would be just as rational to expect the whole body of a man to be freed from the common principle of gravitation, and enabled to elevate itself into the air, or to be able to resist the action of fire, which is a physico-chemical cause, as to suppose that fluids contained in his vessels are exempt from the same conditions, because they form part of a vital and animated machine. We believe, generally, in the solid pathology, and consider the phenomena of diseases principally as vital derangements—but we cannot see room to deny that bones, though they be even living bones, are levers, arches, &c. that tendons and ligaments are really cords, that arteries are actually tubes, and that the crystalline humour of the eye is not only nominally, but really and *bona fide* a lens. The influence of weight upon the circulation is well known to surgeons, and has often been employed by Dr. Physick and others, to purposes of the greatest practical advantage. Nature finds it necessary in the larger vessels to employ the mechanism of valves, in order to give the proper direction to the motions impressed upon the fluids—and we deem that an erring imagination which supposes, because certain vessels are so small that we cannot without difficulty discern them, that they possess the power of impelling the fluids they contain without the usually necessary mechanical means.

It must now be acknowledged as proved by many experiments, that the capillary vessels of some parts of certain small animals, such as frogs and guinea-pigs, are capable of

continuing motion in their contents for some time after the heart has been separated from them. In reasoning from these experiments, however, the elastic force of the arteries is generally neglected. Where this remains, as it is capable of contracting to nearly or quite the entire closure of its calibre,* followed by a similar effort throughout the capillaries themselves, it is evident that a progressive motion through the vessels will continue for "a quarter of an hour," or, "for several minutes," without any circulatory force being attributed to these minute vessels themselves. Now we know that capillaries under the microscope vary exceedingly in the rapidity, and even direction of the motion of the contained fluids. When a part is irritated, its vessels increase in diameter, and blood flows towards it in various directions, even against the course of the general circulation. This latter could certainly not take place were there any valvular structure. These motions, on the other hand, are precisely such as we should expect from a system of vessels, possessing the utmost freedom of communication in every direction, uniformly contracting by a vital force, varied in degree, according to the wants of the system, and at the same time, with an additional contraction by an elastic force, capable of yielding to distention, and of restoring them to their original size. Such a system, incessantly receiving blood from the arteries, although with force somewhat increased during the systole of the heart, but diminished by a friction which increases with that increase, must of course, in the long and minute passages through which it conducts the blood, weaken, and finally destroy the alternate impulse—and in place of this, we should find a general, progressive motion of the fluid in the direction from the tubes which supply it towards those which afford it an exit. The circulation of the whole, as

* We quote from memory from Dr Parry, and from an experiment of Hunter on the anterior tibial artery of a dog, contained in the work on the blood. Dr. Wilson Philip, as well as others, think that entire closure cannot be produced—but every one acknowledges its production to a great extent.

respects the blood, is a question of distention—and where the distending force is increased, as in the arterial direction, the blood will be impelled towards the quarter which yields. In the ordinary state of things, this is that of the veins—but in inflammatory affections, we will not now say why, the equilibrium is disturbed, and the vessels about to carry on the new action, no longer counterbalance the distending force applied to them, and of consequence they enlarge.

When it is said that the capillaries possess a power of circulating the blood, writers most frequently do not define the idea they mean to convey. Some express themselves boldly, like Bichat, and say that the blood is now "hors de l'influence du cœur, et ne circule plus que sous celle du force tonique ou de la contractilité insensible de la part." Others attribute the motion in part to the heart, and partly to the vessels. "Aliquando bonus dormitat Homerus." In vessels without valves, it is impossible to conceive in what manner the mechanical phenomena of a progressive motion can be produced by "force tonique, or contractilité insensible"—any more than by what means the fluids are removed from the influence of the heart. It is a serio-comic instance of a very common error—of substituting a word for an explanation. To say that a thing is done by "*vital powers*," or by "*force tonique*," when we cannot comprehend in what manner these can possibly act to produce the effect, is in reality as frank a confession of ignorance, as the common phrase "it is done somehow with a spring."

All the circulatory fluids of the human body are contained in tubes, habitually contracting on them, with a degree of tension, various according to the nature of the vessel, but still positive, the pressure never being absolutely removed—and the only manner in which they can act unusually upon them, is by varying this pressure. If the pressure be increased, they will expel a part of their contents to those parts which offer less resistance—if diminished, others will force more fluid into them. These motions, if left to themselves, would take place in all di-

rections in which there were free communications, and are confined to the forward one by additional causes. In the ordinary state, the additional cause is the pressure of the arterial blood, *a tergo*—if capillaries be capable of continuing circulation without the presence of the leading arteries, the vis a tergo can no longer subsist, and it is absolutely requisite that there should be mechanical means of preventing regurgitation. In the ordinary valvular structure, this would be provided for in a manner easily understood—but it is evident that in the sanguineous capillaries, this apparatus does not prevail. There remains then no other alternative, but supposing a peristaltic motion resembling that of the alimentary canal, or in other words, that the sides of the vessels themselves should close so as to offer the necessary mechanical obstruction. Now the partial contraction of the intestines is only rendered sufficient by means of a peculiar structure, the valvulæ conniventes—and one admirably adapted to the purpose, and to the semi-solid nature of the substance acted on. In a polished tube acting on so liquid a matter as blood, the same effect could not be produced without a much more entire closure. The capillary vessel must then close its cavity at intervals, and, the hinder part of the cavity contracting, or the closed ring rolling along the vessel, the blood is impelled. Now, first, if such a motion as this existed, it would certainly be visible under the microscope, as the circulation is distinctly visible to a great degree of minuteness—but no such operation has been ever seen—secondly, it is contradictory to every visible phenomenon of the circulation—thirdly, such contraction is a process peculiarly appropriated throughout the animal economy, to the exclusion of improper and unnatural substances. Thus, the glottis contracts on solid and liquid substances, while it admits air—the pylorus retains undigested food, &c.—but in no instance that we know of, is it employed for the mere purpose of impelling fluids.

We think it is hence evident, that the power possessed by the capillaries of producing the phenomena of a partial circulation, (an entire one is out of the question, the aorta

being tied in the experiments alluded to,) is only a general power of contracting and of expelling their contents. By such an operation, a steady current through a part of these vessels, will be kept up for some time—and if, by tying the aorta, the contents of the great arteries be added to the amount to be transferred through them, this appearance will be continued for a longer period—and this we consider quite sufficient to explain the results described to have taken place.

We therefore consider the heart as the only true direct agent of the circulation. That a similar operation is performed in vegetables, and in some animals without a heart, is admitted—but the mechanism is different, and we will add, not well understood. In vegetables, the structure of the vessels is well known to differ widely, and perhaps, not less so in the medusæ and actiniæ. We can draw no inferences in any degree claiming probability from such a loose analogy.

The nature of the connexion between the arteries and the secretory vessels, in their minute subdivisions, as well as that between the vessels of red blood, and those which contain lymph, has never been explained satisfactorily. Richerand asserts that the former is by lateral pores. Magendie believes it is by simple infiltration. The hypothesis of Bichat is in this respect, at least as good as any which we have seen, and when it is applied to the latter connexion, possesses, perhaps, the evidence of regular inductive proof. He considers it as to be presumed, that the different capillary vessels have peculiar irritabilities, suited to the particular kind of fluid which each is destined to contain—and that like other parts of the body, they contract so as to forbid access, when any substance foreign to their nature is presented. Thus, globules of blood are rejected by the vessels appropriated to the reception of a lymphatic fluid—and by those appointed to contain the fluids of a different chemical nature, all the component parts of the blood, except those suitable for the objects for which they were designed.

The reason why fluids do not enter the tubes designed for each other, is defined to be "the want of a proper relation between the organic sensibility of each part of the capillary system, and the fluid which it contains"—"le raiport qui existe entre la sensibilité organique de chaque partie du système capillaire, et le fluide qu'elle contient." In the case of a fluid composed of two distinct parts floating loosely, mixed together, of which the particles of one may be repelled, and those of the other admitted, this explanation may probably suffice—but will any man in his senses really consider it as explaining the separation of elements chemically combined? Yet this is the sum of the theory of the celebrated man whose name we have mentioned above. It is evident that the essential mode in which secretion is performed is yet a secret, and likely to continue so. All that we can do is to inquire into the circumstances attending it, and most of these are in the same situation.

That such an irritability is the cause of the exclusion of red globules, in the vessels containing a lymphatic fluid, is highly probable. It is stated that vessels excluding red blood are often evidently of larger size than others which contain it. In this instance it is sometimes impossible that the difference of size can be the effectual cause, by acting merely as an inanimate strainer—and the mode of operating much resembles that of the pylorus. It is said that a globule may be seen approaching the entrance of a capillary branch, and after several repulses, finally passing off in another direction. There does not seem to be any absolute incompatibility with the preservation of the functions of the part in the admission of blood to the transparent capillaries. This is evinced by the occasional entrance of a straggling globule under the microscope, as well as by the phenomena of blushing, in which the same change takes place to a great extent. Bichat believes the blood in blushing to enter vessels which were previously empty, as he conceives the flow of blood to be too sudden to admit of one fluid being discharged and replaced by another. There is no necessity for this supposition, which we consider purely gra-

tuitous—since the ordinary relaxation of the vessels, suffering an enlargement of their size from distention, as it occurs in inflammation, is amply sufficient to account for it. The phenomenon is well known to exist, as vessels unquestionably do enlarge in this way, whether our mode of accounting for it be acknowledged or not—and if enlarged, they are capable at once of retaining their previous serous contents, and admitting fresh blood in addition.

The subject of animal heat, we must for the present postpone. It is a point not to be dispatched in a few words—and very properly takes whole papers and volumes to itself.

ART. XIX. *Transactions of the Phrenological Society, instituted 22d February,* 1820. *With five engravings.* Edinburgh, 1824. pp. 448, 8vo.

Elements of Phrenology. By CHARLES CALDWELL, M. D. Professor of the Institutes of Medicine and Clinical Practice in Transylvania University. Lexington, Ky. 1824. pp. 100.

WHEN the late Dr. Gordon penned his passionate notice of the doctrines, anatomical and physiological, of Gall and Spurzheim,* little did he, or the confraternity conducting the Edinburgh Review, imagine, that in the lapse of a few years the method of dissecting the brain, so as to display its fibrous structure and unfold its convolutions, recommended and practised by the above named gentlemen, would be very generally adopted, and acknowledged universally as preferable to all former modes—or that within the same period, the alleged ridiculous and reviled positions of craniology would assume such consistency and form as to be ranked among the sciences, and stand foremost among the systems of the philosophy of the human mind.

Accredited in many parts of Germany—taught in Paris

* Edin. Rev. No. 49.

as a branch of medico-philosophical education by its able and eloquent founders—embraced and supported in Edinburgh by a society composed of physicians, lawyers, divines and naturalists—its truth avowed by men of various and extensive knowledge in London—phrenology has crossed the Atlantic, and found a reception by no means discouraging in places conspicuous for the zeal and ability with which general literature and the exact sciences, as well as medical and legal knowledge, are cultivated and expounded. From the ponderous tome of the Encyclopedia down to the lighter monthly periodicals, in essays moral and literary, travels, poetry, and novels, it is made the subject of serious argumentation, or playful allusion—at times, of pointed satire and coarse invective. The current at first adverse, now begins to set in its favour, and we have more reason to fear at present that its followers, flushed with success, may be too impetuously hurried on, than we had formerly to apprehend their discouragement at the little progress made. But the same love of truth, and conviction of having in part found it, which supported them amid evil report in the first instance, will be a sufficient guarantee for the steadiness of their pursuit in the time to come. If, as they assure us, they have cleared away the rubbish accumulated during former ages, we have a right to hope that in its place they will erect a temple of fair and ample proportions, the porticos of which are to be crowded with people of all nations and tongues, who shall hear continually uttered the lessons of wisdom and practical philosophy.

We have been led into this train of reflection on seeing the two works, the titles of which are prefixed to this article. They furnish a commentary neither to be overlooked nor misunderstood, on the nature, influence and diffusion of the principles of phrenology, which are thus brought home to the comprehension of every thinking mind, and applied to the purposes of education, and the guidance of conduct. Each faculty of the mind will, in the new system, form a most interesting subject of philosophical inquiry, and may, to a certain extent, be studied separately from the other—

while the union of them all forms a beautiful exposition of individual character, and an explanation of the apparently innumerable contradictions of human nature.

The Transactions of the Phrenological Society of Edinburgh, now before us, form a volume of no ordinary interest, whether we regard the subjects proposed for elucidation, or the candid and dispassionate manner, in which they are treated—we may freely submit it to be judged by the standard of a late eloquent female writer;* that "metaphysics, arts, sciences, all ought to be appreciated accordingly as they contribute to the moral perfection of mankind."

Prefixed to the work is a list of members of the Phrenological Society, instituted 22d February, 1820. The gentlemen first associated together under this title, were but five in number, viz. George Combe, writer to the signet—James Brownlee, advocate—Andrew Combe, surgeon—William Waddell, writer to the signet—Lindsay Mackersey, accountant—and the Reverend David Welsh. The project originated with the last named gentleman. The number gradually increased, and now amounts to sixty-one ordinary or resident members, two honorary members, Doctors Gall and Spurzheim, and twenty-three corresponding members. Among the first division we find many Fellows of the Royal, and Members of the Wernerian Societies of Edinburgh, physicians, teachers, and artists, and two other reverend gentlemen in addition to the one already mentioned.

"The history of the society since it assumed a public form, will be found in its transactions, but it is proper to advert, in this place, to one point, to prevent misapprehension on the part of the public, and to do justice to the individual members. Each gentleman, at his admission, declares his conviction of the truth of the general principles of the science, viz. that there is in nature a connexion or correspondence between certain mental powers and moral feelings, and certain portions of the brain, and that the energy of the power bears a relation to the size of the organ—but no one is required to profess his belief in the whole, or any given number of the faculties and organs specified in the books upon phrenology, nor to give his

* Madame de Stael.

assent to the metaphysical notions which individuals have engrafted on the phrenological doctrines."

"Those, therefore, who became members, associated themselves for the sake of gaining and communicating a knowledge, in the first instance, of what had been already accomplished by the founders of phrenology, and in the hope of being able only eventually to enlarge its boundaries by their own observations."

This may be received as nearly declaratory of the views and intentions of the members of the society in this city.

The first paper of the Transactions is a preliminary dissertation "On the Progress and Application of Phrenology." By Mr. George Combe, author of the Essays on Phrenology, noticed in a former number of this Journal. It begins with a sketch of the life, and professional and philosophical labours of Dr. Gall, which we regret our limits will not permit us to give entire, as we are very sure it could not fail to interest our readers.

"Dr. Gall, a physician of Vienna, now resident in Paris, is founder of this system. He is descended of a respectable family residing at Tiefenbrun, two leagues distant from Pforzheim, in Suabia. He was born on 9th March, 1757, and is the sixth child of the marriage. His father was a merchant, and mayor of the village. His parents, professing the Roman Catholic religion, had intended him for the church—but his natural dispositions were opposed to it. His studies were pursued first at Baden, afterwards at Brucksal, and then were continued at Strasbourg. Having selected the healing art for his profession, he went, in 1781, to Vienna, the medical school of which had obtained great reputation, particularly since the times of *Van Swieten* and *Stoll.*"

An account is then given of the manner in which Dr. Gall was led to the study of the natural talents and dispositions of men, his views of which terminated in the phrenological system. Being from an early age given to observation, he was struck with the fact that each of his brothers and his sisters, companions in play and schoolfellows, possessed some peculiarity of talent or disposition. Each individual presented a character peculiar to himself. "The scholars with whom young Gall had the greatest difficulty in competing, were those who learned by heart with

great facility—and such individuals frequently gained from him by their repetition, the places which he had obtained by the merit of his original compositions."

On changing his place of residence he still met individuals endowed with an equally great talent for learning to repeat. He then observed that his schoolfellows so gifted possessed prominent eyes—and he recollected that his rivals in the first school had been distinguished by the same peculiarity. On entering the university he soon found, and the correctness of the observation was recognized by the other students, the connexion between the talent and the external sign. He suspected, therefore, that they stood in an important relation to each other. "After much reflection, he conceived that if memory for words was indicated by an external sign, the same might be the case with the other intellectual powers, and from that moment all individuals distinguished by any remarkable faculty, became the object of his attention. By degrees he conceived himself to have found external characteristics which indicated a decided disposition for painting, music and the mechanical arts. He became acquainted also with some individuals remarkable for the determination of their character, and he observed a particular part of their heads to be very largely developed. This fact first suggested to him the idea of looking to the head for the signs of the moral sentiments. But in making these observations, he never conceived for a moment, that the *skull* was the cause of the different talents, as has been erroneously represented—he referred the influence, whatever it was, to the brain."

In pursuing his investigations, he encountered great difficulties in the extraordinary conflict of opinions every where prevailing. He found that the moral sentiments had, by an almost universal consent, been consigned to the thoracic and abdominal viscera—and that a great number of philosophers and physiologists had asserted that all men are born with equal mental faculties, the differences among them proceeding either from education, or the accidental circumstanses in which they are placed. This difficulty he

combated by the reflection that his brothers, sisters and schoolfellows, had all received very nearly the same education, but that he had still observed each of them unfolding a distinct character, over which circumstances appeared to exert only a limited control. For the present, that we may not break the thread of our narrative, we forbear arguing this topic.

"Dr. Gall, therefore, abandoning every theory and preconceived opinion, gave himself up entirely to the observation of nature. Being physician to a Lunatic Asylum in Vienna, he had opportunities, of which he availed himself, of making observations on the insane. He visited prisons, and resorted to schools—he was introduced to the courts of princes, to colleges, and the seats of justice—and wherever he heard of an individual distinguished in any particular way, either by remarkable endowment or deficiency, he observed and studied the development of his head. In this manner, by an almost imperceptible induction, he conceived himself warranted in believing, that particular mental powers are indicated by particular configurations of the head." P. 7.

Hitherto he had only resorted to physiognomical indications, as a means of discovering the functions of the brain. But he was soon led to see that physiology is imperfect, when separated from anatomy—and felt the necessity of making anatomical researches into the structure of the brain, on seeing a woman who had been afflicted with hydrocephalus (dropsy of the brain,) from her youth, and who yet possessed a mind as active and intelligent, as that of other individuals of her class.

" The successive steps by which Dr. Gall proceeded in his discoveries, are particularly deserving of attention. He did not, as many have imagined, first dissect the brain, and pretend by that means to have discovered the seats of the mental powers—neither did he, as others have conceived, first map out the skull into various compartments, and assign a faculty to each, according as his imagination led him to conceive the place appropriated to the power. On the contrary, he first observed a concomitance betwixt particular talents and dispositions, and particular forms of the head—he next ascertained, by removal of the skull, that the figure and size of the brain are indicated by these external forms—and it was only after

these facts were determined, that the brain was minutely dissected, and light thrown upon its structure." P. 8, 9.

The first written notice of Dr. Gall's inquiries concerning the head, appeared in a familiar letter to Baron Retzen, which was inserted in the German periodical journal "Deutschen Mercur," in December, 1798.

In 1796 he commenced giving courses of private lectures at Vienna.

"Several of his hearers, as well as others who had never heard him lecture, published notices of his doctrines; and have represented them with greater or less exactness. Among the latter class the following deserves to be noticed.

"*Froriep.*—Who has printed an exposition of the doctrine of Dr. Gall—third edition, 1802.

"*Martens.*—Quelque chose sur la Physiognomie. Liepsic, 1802.

"*Walther.*—Exposition critique de la doctrine de *Gall*, avec quelques particularités concernant son auteur. Zurich, 1802.

"Having continued his lectures for five years, on the 9th of January, 1802, the Austrian government issued an order that they should cease, his doctrines being considered dangerous to religion. A general regulation was made upon the occasion, prohibiting all private lectures, unless a special permission was obtained from the public authorities. Dr. Gall understood the object of this "General Regulation," and never solicited permission, but rather stopt his courses. The doctrines, however, continued to be studied with greater zeal than before, the prohibition strongly stimulated curiosity, and all publications on the subject continued to be permitted, provided they abstained from reflecting on the government for issuing the "general order."

"In 1800 Dr. Spurzheim commenced his labours along with Dr. Gall, and in that year, assisted for the first time at one of his courses of lectures. Phrenology owes so many valuable additions and discoveries to the talents and exertions of this gentleman, and in Britain we are so exclusively indebted to his works, and his personal exertions, for a knowledge of the science, that the introduction of a few particulars concerning him, cannot fail to be interesting and appropriate.

"Dr. Spurzheim was born on the 31st of December, 1776, at Longuich, a village near Trèves, on the Moselle. His parents cultivated a farm of the rich Abbey of *St. Maximum de Trèves;* and he received his college education at the University of that city. He was destined by his parents to become a

clergyman, but in 1799, when the French invaded that part of Germany, he went to Vienna to study medicine, where he became acquainted with Dr. Gall. He entered with great zeal into the consideration of the new doctrine, and to use his own words, 'he was simply a hearer of Dr. Gall till 1804, at which period he was associated with him in his labours, and his character of hearer ceased.'*

"Having completed his medical studies, he and Dr. Gall quitted Vienna in 1805, to travel together, and to pursue in common their researches into the anatomy and physiology of the whole nervous system. In the period which elapsed between the interdiction of Dr. Gall's lectures in 1802, and the time when he and Dr. Spurzheim left Vienna, the doctrine had made a rapid progress, not only in general diffusion, but in solid and important additions—a fact of which any one may be satisfied, by comparing the publications by Dr. Gall's auditors already mentioned, with those by his hearers in the different towns in Germany, visited in the course of his and Dr. Spurzheim's travels. The following works, in particular, afford evidence of the state of the science in 1805.

"*Bischoff.*—Exposition de la doctrine de *Gall* sur le Cerveau et la Crâne, suivie de remarques de Mr. *Hufeland* sur cette doctrine. *Berlin*, 2de edit. 1805.

"*Blœde.*—Le Doctrine du *Gall* sur les fonctions de Cerveau. Dresde, 2de edit. 1805.

"From 1804 to 1813 Dr. Gall and Dr. Spurzheim were constantly together, and their researches were conducted in common. They left Vienna on the 6th March, 1805, to go direct to Berlin, and thereafter visited a variety of places, remaining at each the time noted below.†

"From November 1807 to the present time, Dr. Gall has never left Paris. In June 1813, Dr. Spurzheim paid a visit to Vienna, from which he proceeded to Britain, and arrived there in March 1814. During his stay he published in English, 'The Physiognomical System of Drs. Gall and Spurzheim,' in 8vo.; an 'Outline of the System,' in 12mo. and a work shewing the application of phrenology to the subject of insanity. He also delivered lectures in London, Bath, Bristol, Dublin, Cork, Liverpool, Edinburgh. He returned to London in 1817—delivered again a course of lectures—became a licentiate of the Royal College of physicians in that city, and in the month of July of the same year, returned to Paris, in which capital he has

* Essai Philosophique sur la Nature morale et intellectuelle de l'Homme, par *G. Spurzheim*, M. D. Appendix, p. 213.

† We do not deem it necessary to give the list from the volume before us, but merely say that almost every city of any note in Germany, Holland, and Switzerland, was visited by them in 1805–6 and 7.

since remained—and there says he, 'je me propose de passer la reste de ma vie, occupé de la connoisance de l'homme dans l'état de santé et de maladie.'

"Dr. Spurzheim has contributed largely to the advancement of phrenology, by enriching it with important discoveries, by introducing into it philosophical arrangement, and by pointing out its application to many interesting purposes connected with the human mind."* p. 10—14.

During Dr. Spurzheim's absence from Paris, Dr. Gall did not lecture—after his return Dr. Gall delivered one private course in his own house, and two public courses, gratis—one, "á l'Ecole de Medecine," and the other in a hall "de l'Institution pour les Aveugles." Dr. Spurzheim has delivered two courses each year since he settled in Paris, "sur l'Anatomie, la Physiologie, et la Pathologie du Cerveau, et des sens exterieurs," each course lasting three months—and he intends to continue his lectures in succeeding years. "Phrenology," says he, "had been in a great measure forgotten during several years, but it gains new strength. The ridicule which pursued it in France is overcome, and it now bears the reputation of a science. My auditors have increased in number each succeeding course—and as a great part of them are strangers from different regions, they will not fail to spread their doctrines in their native countries. The zeal and assiduity with which they have followed my instructions, authorise me to entertain this expectation." p. 15—16.

To the correctness of this belief, we can, both for ourselves and many of our medical brethren and friends, bear the most ample testimony. The Phrenological Society in this city—the "Essays on Phrenology," by Mr. Combe, republished here—and the various articles on the subject prior to the appearance of the "Elements of Phrenology," by Dr. Caldwell, of Lexington, are so many proofs of the fulfilment of Dr. Spurzheim's prediction. We feel our-

* Since his return to Paris, Dr. Spurzheim has published, in French and English, a work on "Elementary Principles of Education, founded on Phrenology"—also, another work, already cited, in French, *Essai Philosophique, &c.*

selves more peculiarly called upon to the frequent and open avowal of our conviction of the truth of this science, as a kind of atonement for having so long and so wilfully declined inquiring into its merits, and for having spoken of it with a warmth of intolerance which we fear may have been regarded as an infringement on the rules of politeness, and a breach of courtesy. We may still farther confess, and in so doing speak for many of our friends, that accident, more than any fixed intention of making ourselves acquainted with the philosophy of the human mind, first led to our knowledge of Phrenology. Months had elapsed without ever inquiring after Gall or Spurzheim, though living in the same city with them—and we might have left Paris, but for an introduction to one of those good easy men whose probity we are more apt to admire than their talent. This gentleman, in the course of conversation, alluded to Dr. Spurzheim's lectures on phrenology, which were to commence on the following day, and spoke of them and the science in terms of approbation. In reply to our expressions of ridicule, he merely remarked that before he heard the Doctor lecture, he thought as the present company then did on the subject, but he would add in conclusion, that if we took the same trouble, our conviction of the excellent tendency of the system would be as strong as his own. The proposition implied in this opinion was so reasonable, that we could make no answer, and determined to avail ourselves of the opportunity thus offered, without, however, an expectation of our sentiments undergoing any change. We attended Dr. Spurzheim's lectures to gain fresh matter for ridicule, rather than with a hope to add to our stock of useful knowledge. The duration of the course was short, and the vogue in which the new doctrines were, seemed to justify the sacrifice of a few days. The first hour was sufficient to dispel the prejudices arising from preconceived notions of Dr. S.'s manner. We did not, as we had expected, see a charlatan of the *quai*, with all his hurried utterance and vehement gestures, but a man calm and dispassionate in the delivery of his opinions, which, though

advanced with philosophic caution, were supported by positive testimony, and occasionally embellished by a variety of analogical illustrations. Determined henceforth to listen to the Doctor dispassionately, we soon experienced a revolution in our mind, and felt that conviction of the truth of the great outlines of phrenology, had superseded prejudice and disbelief. We found, now, something more practical and important in this method of studying the philosophy of the human mind, than by those which we had formerly essayed. We had not possession of words so harmonious in sound, or poetically collocated in writing, but we obtained more definite and precise ideas of human nature, and a certain facility of analyzing the operations of the human mind, and tracing the motives of conduct.

Metaphysicians did, indeed, by attending to their own consciousness, ascertain and describe the relations of their own thoughts and feelings, and occasionally these may be found to correspond with the thoughts and feelings of others, but their systems do not exhibit complete and practical views of human nature. We may repeat, in the language of the article before us:—

"The method of inquiry pursued by Dr. Gall, having for its object the discovery of the relation betwixt the mental powers and their organs, possessed advantages peculiar to itself, and was free from the objections to which the methods of the physiologists and metaphysicians were liable. He attended to facts presented to his senses and understanding, and was thus led to a knowledge of a relation existing in nature, betwixt particular portions of the brain and particular faculties of the mind. However short, therefore, of complete success, his inquiries may appear to some at present to be, it is indisputable that he and his followers are in the road which leads to truth. His mode of philosophizing has nothing in common with the formation of an hypothesis—and so far from a disposition to invent a theory being conspicuous, there appears, in the disjointed items of information which he at first presented to the public, a want of even an ordinary regard for systematic arrangement. His only object seems to have been, to furnish a candid and uncoloured statement of the facts in nature which he observed—leaving their value to be ascertained by time and farther investigation. The slightest attention to the observations of Dr. Gall's auditors, before mentioned, will prove beyond a doubt that this was really

the manner in which he made all his discoveries. A member of the society possesses a small work, entitled 'Dr. J. F. Gall's System of the Functions of the Brain, extracted from *Charles Blœde's* account of *Dr. Gall's* lectures, held on the above subject at Dresden—translated from the German.' *Blœde's* work, as already mentioned, was published in 1805—and in the translation the following list of organs is given:

1. The impulse to propagation.
2. Tenderness for offspring.
3. Memoria realis, (Individuality.)
4. Locality.
5. The organ of the recollection of persons, (Form.)
6. The disposition of Colouring.
7. Sounds.
8. Arithmetic.
9. Words.
10. Languages.
11. Mechanic skill.
12. Friendly attachment and fidelity.
13. Valour.
14. Murdering.
15. Cunning.
16. The organ of Larceny.
17. Height, (Self esteem.)
18. Ambition and Vanity.
19. Circumspection.
20. Comparative perspicuity, (comparison.)
21. Metaphysical perspicuity, (casualty.)
22. Wit.
23. Inference.
24. Good nature, (benevolence.)
25. Theosophy, (veneration.)
26. Perseverance, (firmness.)
27. Mimicry, (imitation.)

"In the Monthly Magazine, also, for 1806, a plate and a list of the organs will be found exhibiting the discoveries then made, in which, as in the preceding instance, there is no philosophical principle of justification, no attempt at analysis of the powers, but a mere description of development and accompanying manifestations—and there were, as there still are, blanks in the views of the cranium, as well as faculties wanting in the list.

"But what followed? As soon as observation had brought to light the great body of the facts, and the functions of the faculties had been contemplated with a philosophical eye, a system of the philosophy of the human mind presented itself almost spontaneously to view, 'unlike others presented to us, which appear in comparison but as mere diagrams, the result of study and imagination, while this seems like a portrait from life by masterly hands.'* When the work of discovery had proceeded a certain length, the facts appeared to be connected by relations which it was impossible sooner to perceive—and system and arrangement at length suggested themselves, where disorder only had previously reigned. Hence it was not until after phrenology had been cultivated for several years, that its real nature

* Reflections on Gall and Spurzheim's system of Physiognomy and Phrenology, by John Abernethy, F. R. S. &c.

and utility were discovered, and it was only then that its form became systematic. Hence, also, its character and its name changed as it proceeded—and from a mere species of physiognomy, it has become a science capable of the most useful and interesting applications."

The writer then proceeds to show in more detail, the advantages which phrenology is calculated to confer on the philosophy of the human mind. No system of the philosophy of man, is entitled to the name, which neglects the connexion between organization and the manifestations of the mind, and treats of the latter as a disembodied spirit—"And yet *Locke*, *Reid* and *Paley*, *Stewart* and *Brown*, are as silent upon the organs of the mind, as if the mental functions were performed independent of the body. The phrenologist, on the other hand, regards man as he actually exists, and (to adopt the ideas of Mr. Stewart) desires to investigate the laws which regulate the connexion betwixt the organs and the mind, but without attempting to discover the essence of either, or to explain the manner in which they are united."

In the next place, when we inquire of the philosophers how many faculties they admit, we find the very fact of the *existence* of faculties still under dispute. We forbear pressing this part of the subject on the attention of our readers at this time, but may refer them to former articles and reviews in the pages of this Journal, in which they will find the leading arguments in favour of the plurality and variety of the faculties of the human mind—a doctrine clearly consonant to popular belief, and implied, indeed, in the very structure of ordinary language. "Phrenology, by presenting to observation a corporeal organ, by means of which a particular faculty manifests itself, will tend considerably to do away with the airiness and shadowy uncertainty which at present attend this branch of metaphysical science. For example, when a sufficient number of instances have been observed, in which the power of experiencing the sentiment of justice has been strong, when a certain part of the brain has been large, and weak when the same part has been small, it will be difficult to dispute any longer

the existence of such a primitive sentiment, although it has been contested for the last two thousand years."

"In the *third* place, phrenology displays a conspicuous superiority over the common metaphysical systems in its containing elements, "by the various combinations of which every variety of sentiment and intellectual power occurring among individuals, may be explained, not by an arbitrary use of terms, and an invention of faculties to serve in each emergency, but by a rigid application of fixed and philosophical principles, announced as essential parts of the science."

In the *fourth* place, continues the author, the metaphysicians, even had they been successful in their analysis of the faculties, ought to have remembered that these faculties are possessed by different persons in different degrees, and different ratios—and that we have not received from these philosophers any explanation of the effect of such differences on the dispositions and talents of individuals.

In the *fifth* place, as the manifestations of the mind are subject to derangement, a true theory of intellectual philosophy ought to contain principles capable of explaining the mental phenomena, both in a state of health and disease. But when a question occurs respecting the state of mind of an individual who is suspected of alienation, do courts of law resort to *Locke*, *Hume*, *Reid*, *Stewart*, *Paley* and *Brown*, or the gentlemen who have studied their writings, for evidence respecting the real condition of his mental powers? No. Far different would be the course were phrenology received as the standard philosophy of mind.

"In the *sixth* place, the laws and institutions of society emanate from the primitive dispositions and intellectual faculties of man—but until a successful analysis of the latter is presented, and the dependence of the former upon them clearly pointed out, we must remain, in a great measure, in doubt whether many of the regulations which men are called upon to observe, are the *legitimate dictates of nature*, the casual offspring of chance, or merely the abuses of authority, established under various systems of govern-

ment, for the advantage of a part of society at the expense of the rest. In searching for principles, also, to guide our taste and judgment in literature and the fine arts, it is obvious that a correct view of the ultimate principles of the mind, and of the effects of these combinations, must be of the last importance. While these points remain in obscurity, there is little check upon the attempts of presumptuous individuals, who endeavour to erect themselves and their productions into the standards of excellence, and subject the public to the dominion of vicious fashions, instead of the dictates of a correct taste."

The able writer of this highly instructive paper, concludes with a few observations on the nature of the evidence on which phrenology rests. We must content ourselves with the following:—

"The proposition, that a certain mental power is connected, by nature, with a certain portion of the brain, relates to physical science, and can be proved or disproved only by observation. The province of reason, in such a case, is to compare the phenomena observed—to discover their relations—and to draw from them just conclusions; but not to determine, beforehand, whether the appearances alleged can or cannot exist in nature. Those persons, therefore, who attack the doctrines by mere arguments, whether founded on analogy or on previous opinions, only render complicated a question which in itself is simple—for if the facts alleged by the phrenologists really exist, all reasonings which go to contradict them, must of necessity be defective in premises, or unsound in deduction—and if they do not exist, the whole fabric of the system will fall to the ground, without the aid of any other objection."

Following this preliminary dissertation, is "Outlines of Phrenology," by the same author. This is an abridgment of his larger work, republished in this city, and noticed in a former number of this Journal.

The papers of the Society in the order of enumeration, are:—

"I.—*A View of some of Dr. Spurzheim's Lectures, as delivered at Edinburgh, in the winter of* 1816. By Dr. Poole. Read May, 1823."

Ample justice is here rendered to Spurzheim by Dr.

Poole, who was one of his auditors in the lectures above alluded to—and who quotes in the following words the philosophical advice of the former. "Do not," said Spurzheim, "believe any thing because I affirm it, nor, on the other hand, object to it merely because others have done so before. I may err, and others may err, but nature is always true and constant—see and judge of her for yourselves." Dr. Poole's remarks are worthy of repetition.

"The object of the science is not what it has often been asserted to be. No investigation into the *nature* of mind is even so much as attempted in it. We know no more of mind, as it is in itself, than we know of matter—and accordingly, we must content ourselves with observations on the properties of the one, and the manifestations of the other, as presented through the medium of our bodily organs. No argument, it is evident, is thence to be drawn as to the materiality of the mind. Such a question is never once agitated in the system—far less does the system afford any thing like an approach to the affirmative, as has sometimes most erroneously been imagined. The doctrine, it is acknowledged, may be abused—but in this respect it does not differ from any other science, nor from any of the gifts of nature, all of which may be, and most of which have been, productive of evil, through the depravity or weakness of mankind. This may be particularly instanced in the professions of medicine and law, and in the religious feeling or propensity, which, however natural to our species, has often been perverted to persecution and the most disgraceful absurdities." P. 93.

Some propositions are given respecting the brain. The first, "is that without it no manifestation of mind has ever yet been known."

The second, "founded also on observation, is, that a certain quantity of brain is required for the manifestation of mind. In other words, a brain may be too small to admit of the usual manifestations of mind."

"In the third place, it may be remarked, that, other circumstances being alike, the manifestations of the mind bear a proportion to the size of the brain. But here it is necessary to guard against mistake. The best way of doing so, perhaps, is to state, that size is only *one* of the conditions on which the manifestations depend—or, in the language of mathematics, it is one of the terms of an equation—and that there are other

conditions, all of which require to be known before any special conclusion is warranted. But universally, it may be affirmed that men remarkable for the versatility and general scope of their genius, that is to say, for an aptitude to excel in whatever they engaged themselves in, have large brains, and these are so distributed as to give great fulness to the fore and upper parts of the head. This may be instanced in the case of Lord *Bacon*, with whose cast we are all familiar. But the converse of the proposition, it ought to be carefully remembered, is not maintained. All that is asserted is, that persons displaying universal genius in a high degree, possess large brains, arranged as has been mentioned—but there may be, and are, examples of large brains, where universal genius, or a great and wide range of talents, has not been manifested. It can easily be understood, indeed, that the consistency of the brain—the temperament of the constitution—the degree of exercise of the talents, and other circumstances, are likely to have a certain influence."

The same circumstances which are acknowledged to modify the power of action of the muscular fibre, must also be supposed to influence the cerebral fibre. The continued, energetic, and successfully varied exertions of both, must mainly depend upon innate energy, comprising size and temperament. Next in importance comes exercise. This is but an expression of the course of nature, for which, however, Dr. Spurzheim has been censured as one wishing to escape from a difficulty, by admitting other qualifying circumstances in the solution of the problem, when in reality he never taught the exclusive influence of one sole cause.

"The poets who are most remarkable for their fidelity to nature, have not been inattentive to the differences now alluded to. Shakspeare, for instance, speaks of 'foreheads villainously low'—and Milton, describing, on the other hand, our first parent, is careful to notice 'his fair large front.' The portraits of these two illustrious men, it may be added, are no inadequate evidences of the truth of the proposition contended for."

Dr. Poole then proceeds to refute the vulgar error, strangely accredited by some writers having pretensions to physiological information, that the different viscera, as the heart, stomach, liver, spleen, &c. are the seats of different affections or emotions of the mind. He gives the reasons

in favour of the brain being of a complex nature, or consisting of many organs—and with Spurzheim, does not lay much stress on the light which anatomy affords on the functions of any of the organs. He cautions the observer on the necessary qualifications and explanations required after a general view of the system.

"*First,*" he says, "let it be understood why the form and size of the head are imagined to be indicative of the dimensions and conformation of the brain."

This is accomplished by referring to the well known progress of the growth of this part of the human frame. In the *earliest* stage, the brain exists before it is covered by the skull, which, after a time, when it is forming, takes the figure and outline of the brain. So also in after life, if dropsy in the brain distend it, the skull follows this enlargement of the inner or softer mass.

"*Secondly*. We must distinguish between the neat size of the skull, and the gross dimension of the head. The former alone is of moment in this system. Inattention to allow for, and except several things which serve to make up the latter, will infallibly produce mistake in determining the developments."

Among these are some protuberances, destined to particular purposes, which have no manner of reference to the development of the organs—and with these the unscientific student should be early apprised, lest he should err in the very onset.

"*Thirdly.* It must not be imagined that it is the mere surface of the brain which constitutes the organs. On the contrary, these are conceived to extend downwards throughout the whole, or nearly the whole mass of the brain.

"*Lastly*. It is admitted that there are cases in which it is impossible to determine the size of the brain in general, or of its individual parts, from the dimensions or the form of the head. Thus the brain may be diminished from age, though the external size and form remain nearly the same, in which case, the skull itself becomes thicker than formerly. A similar change is sometimes found in cases of insanity, and it is probable, that certain diseases of long continuance may prove no less destructive of the ordinary indications."

In reference to the ungentlemanly and unphilosophical opposition frequently made to phrenology, Dr. Poole quotes the very appropriate language of Professor Playfair, which concludes his essay. "Even in matters purely intellectual, the prejudices and the selfishness, or the vanity of those who pursue them, not unfrequently combine to resist improvements, and often engage no inconsiderable degree of talent in drawing back, instead of pushing forward, the machine of science. The introduction of methods entirely new, must often change the relative place of men engaged in scientific pursuits—and must oblige many, after descending from the stations they formerly occupied, to take a lower rank in the scale of intellectual advancement. The enmity of such men, if they be not animated by a spirit of real candour, and the love of truth, is likely to be directed against methods by which their vanity is mortified, and their importance lessened."

"II.—*On the Functions of Combativeness, Destructiveness and Secretiveness—with Illustrations of the effects of different degrees of their endowment on the Characters of Individuals.* By Mr. Scott."

While we deny the existence of any innate evil propensities in man, we are bound to confess that powers naturally intended for his self-preservation and protection, both for subjecting the inferior animals to his will, and sacrificing their lives for his support, and for resisting the injustice or encroachments of his fellow men, may in some instances acquire such a fearful predominance as to lead on to crime, to theft, deceit, and to murder. A most senseless outcry has been raised against the new system for attempting, not to give new dispositions and propensities to man, but to reduce their operations to some rule, and to show under what circumstances they are most active.

The child, whose delight is to torture insects—the youth, who finds pleasure in the painful writhings and distorted movements of domestic animals, goaded by some invention of his cruelty—the sportsman, regardless of fatigue in the gratifications of the chase, and the death of the stag, the

hare and the fox, or in bringing down the harmless bird by his murderous gun—are actuated by a feeling distinct from imitation, education or metaphysical subtleties. It is neither destroyed by refinement, nor called into action by sophistical reasoning. Man in his savage state, deliberately and without remorse, destroys his enemy abroad, and puts an end to the life of an aged parent at home—in a more civilized state, he will meet his enemies in the field in military array, and witness the destruction of thousands without a single painful sensation. In civil life, he is occasionally found breaking through all the bonds of society, and apparently urged on by mad impulse, destroys his fellow-citizen. The enormity of his first offence palliated, and pardon granted, do not prevent him from repeating the crime, apparently without motive, but not unfrequently with the entire preservation of his other mental faculties. Sad experience now shows him to be no longer a fit member of society, and perpetual seclusion or ignominous death, puts a stop to his career. Of the thousands who crowd to witness his execution, some may pity his fate, others with stern justice refuse to yield him any sympathy—all of them might turn abhorrent from the proposal of murder, yet all gaze with a degree of satisfaction on the violent death of the murderer. Whence arises this feeling or propensity of our nature—innocent or necessary, when it leads to regard with indifference the destruction of the lower animals slaughtered for our use, or to resist even to the death wrong and tyranny—faulty and criminal when it gives us delight in scenes of blood, or impels to indiscriminate and unprincipled destruction? The phrenologists say, that its energy is proportionate to the development of a certain portion of the brain—and add that the disposition to fight, to engage in strife, to resist with passion any attempts at coercion, is in the ratio of the fulness of a part of the brain adjoining the other, and to which they give the name of the organ of *combativeness*. The first annunciation of such a fact, makes the mother cry out with horror at the idea of her child having organs of fighting and destroying—leads the judge

to exclaim that the ends of justice will be perverted, if criminals are excused by their being instinctively and of necessity led to crime, in virtue of their very organization—and to crown all, we hear the preacher uttering anathemas against a doctrine which seems so derogatory to the dignity and beneficence of the divine author of our being. But this first paroxysm of mistaken affection, and misguided zeal in these persons, having passed away, we would ask the mother whether she would wish to know early and fully the bent of her child's disposition to cruelty, or prefer having it masked until it break out in mature age with fearful and unrestrained violence—whether its fondness for torturing insects and animals is to be viewed as a capricious amusement, and left to time and accident for its removal, or at once viewed as an innate propensity in excess, which may, however, be lulled to inaction by sedulously withdrawing every exciting cause that could at all minister to its gratification, and by a doubly careful cultivation of the other and better sentiments of *benevolence*, or *justice*, or *veneration*. The physical evidence before her, she cannot remove it, but she may by the above steps moderate its violence, and subject it to salutary restraint. To the judge we would say, have you not, as a man of humanity, often had your feelings harrowed by the frequent appearance before you of the hardened and impenitent criminal, whose liberation after punishment to-day, is but the prelude to fresh crimes to-morrow? You cannot, after hearing of the continued enormity of his misdeeds, but regard him as little better than a wild beast, whom it is unsafe any longer to trust at large. If now, a person, who has made human nature his study, should perchance point out to you the configuration of this man's head, and ask you to compare the great fulness above and breadth between the ears, with the narrowness of the same part in your own, or in that of a man known to you as notoriously mild and peaceable, and averse to all scenes of violence—you might ask what inference was to be drawn from a difference which you would be at first disposed to consider as fortuitous—but if conti-

nued observation and comparison indicated the same constant differences between the ferocious and the humane, what would be the practical applications for you to make in reference to the prevention of crime, and the degree and kind of punishment? Ought such an addition to our means of appreciating human character be viewed with more disapprobation than the physiognomical skill of a physician, who in the complexion and eye of a person before him, sees the approach of disease? The preacher unremittingly, feelingly and mournfully, dwells on man's depravity, on the violence of his passions, and his habits to sin. He does not speak doubtingly on this head, or as a metaphysician, giving new powers and faculties to man—his language is that of sad experience. And is the science which but echoes this language, and points out all the associating circumstances to be reprobated as a damnable heresy? Phrenology does not exhibit human nature in a new or more fearful light. If it speak of evil, it is because there is evil. It has no pretensions to new creations. Man's actions are the consequence of certain propensities. Are these propensities connected with, and evidenced by a certain organization? If they are so related, the utility of such a combination must soon be made evident.

We have hitherto spoken of the isolated and direct evidences of these propensities in their unmodified operation—but we shall find them most usually controlled by other faculties of a higher and more ennobling order. Human nature under their exclusive influence would be brutalized—whereas, if conjoined with other powers, they communicate an energy and impulsion to the character which are often requisite in the concerns of life. We all feel daily and hourly this play of contradictory sentiments and conflicting emotions. Almost every man has felt himself frequently compelled to resent injuries, real or imaginary, at the moment of their infliction, and he is only restrained by the operation of other and more elevated feelings. Some are always hasty and passionate—impatient of contradiction, yet loving dispute. In them the organ of

combativeness is generally well developed. Still its action will never run to any great excess, if *conscientiousness* or *benevolence* be present—even the *love of approbation* will often operate as a most effectual check upon a very large endowment of this faculty. But it is time we should notice the paper of Mr. Scott, the title of which has led us into the above disquisition.

"To observe, says this gentleman, the lower propensities aright, we should look first at their effects in the lower animals, where they are not, at least not so perfectly as in man, controlled and modified by powers of a superior kind. In the brutes they frequently appear single and unrestrained—and while any of them is naturally predominant, or for the time in a state of activity, they rush to its gratification with a fury which disregards all consequences."

Of *combativeness*, Mr. Scott remarks:—

"This propensity is not confined to the mere act of fighting, that being only one of the modes in which it manifests itself. It seems to be the primum mobile of our constitution—the main-spring which sets the wheels of the machinery in motion. Its essence seems to be a sort of restlessness—an impatience of ease—an abhorrence of a state of inactivity. By itself, it is a blind impulse, delighting in opposition for its own sake—a restless spirit of contention, without end or object—but under the direction of higher powers, it gives boldness and force of character, and enables these to act with energy and effect."

"It is of use, not merely in the contests of the field, but in the collisions of civil life, whenever our views happen to clash with, or be opposed to, those of others. It may display itself in the bloodless contests of the bar or the senate—and even among the softer sex, in the rivalries of the boudoir and ball room, no less than in the arena, or in the field of battle."

The following extract will amuse even the most devoted Hibernian, who will, we presume, acknowledge its correctness in part, while he awards to his English brethren a large endowment of *self-esteem*, and to his Scotch neighbours a full development of *cautiousness*.

"But combativeness does not show itself in perfection when combined with any other principle of action. There are many who may be ready enough to strike, when 'they see occasion;' but true combativeness shews itself in prompting to strike,

whether there be occasion or no. This appears nowhere better exemplified at the present day, than in the character of the low Irish. The Irishman seems to exhibit the very *beau ideal* of combativeness. It would be interesting to know if this is accompanied by a corresponding development. There is in this strange race a mixture of ferocity and fun, which seems to be inexplicable on any other principles than those of phrenology. It is explained at once by supposing that the organs of combativeness and wit exist in them, in a state both of high development. If this shall prove not to be the case on an attentive examination of the Hibernian sinciput and occiput, it will in no small degree contribute to shake my belief in the doctrines of phrenology.

"The Irish of the lower ranks, it is well known, delight in fighting for its own sake. A blow is with them a smart repartee, and fighting an agreeable exercise to keep the blood in circulation. On all occasions which bring the people together in any considerable numbers, whatever may be the ostensible purpose or pretence, they can never separate without the most decided manifestations of this propensity."

Mr. Scott might have added, that they are still more felicitous in the regular display of it when in battle array. It was by an army, the majority of which was Irish, and headed by a general also an Irishman, that the British flag was borne, after years of struggle, triumphant from the banks of the Tagus to the walls of Bayonne.

Of *destructiveness* the writer tells us:—

"It is this faculty, as it appears to me, which gives to the character its greatest energy and power. It lends a peculiar force to the accents of command. Every command so enforced implies in it a threat: 'Do thus, or thus, as ye shall answer.' It is an intimation of the will of the speaker, coupled with the farther intimation expressed or implied, that disobedience will be attended with fatal or inconvenient consequences. This power, accordingly, is highly necessary to the chiefs of savage or uncivilized nations, and even among a more refined people, to the commanders of armies. Robert Bruce, in former days, and Bonaparte in our own, had this organ in large development."

"*Of Secretiveness.*

"All have this propensity in a certain degree. There are none who do not conceal, or endeavour to conceal, some part of what passes in their minds. The mind can no more be with-

out a covering than the body—and a veil, more or less opaque, is equally proper for both. Now, as secretiveness gives the desire of concealing our own thoughts and feelings, so it also gives the desire of discovering the thoughts and feelings of others—and to this extent it gives the power of doing so, that it reads in them the natural language or outward expression by which this desire of concealment manifests itself. There is a *manner* which is peculiar to secretiveness—an appearance of closeness and reserve, which, even in concealing, betrays to us that something is concealed. In spite of every art, there is something in the conduct, where this exists, different from the open, straight forward course of plain, undisguised truth—and be these indications as faint as they may, those who possess the power strongly themselves, will not fail to mark them through the thickest disguises."

"Although this be an instinctive propensity, and in those who possess it in a strong degree it acts independent of any other motive, it certainly is excited most powerfully when matters are to be agitated which the party is conscious are of an improper or criminal nature. Setting conscientiousness out of the question, which in such persons may be supposed to have little influence, cautiousness and the love of approbation unite with the native love of secrecy, in inducing them to use every art of concealment over what is too monstrous to endure being looked on. Even when it is necessary, in the prosecution of criminal designs, to reveal them to others, it is done in the most cautious manner, and the intention rather hinted at by dark surmises, than openly spoken out and avowed. There is a scene in 'King John,' when that monarch wishes to induce one of his followers to murder the young and innocent Prince Arthur, where this is represented with the most consummate art."

This love of secresy is not, however, confined to the hiding of criminal thoughts and desires. Those in whom the propensity is strong, love to make a mystery of every thing. We are told by *Boswell* that *Johnson* "delighted in making a secret of such an affair as his going out to dinner."

Mr. Scott asserts :—

"It has been observed in a great variety of instances, and may almost be taken as an ascertained fact, that all great actors, all who attain any eminence in the higher department of the scenic art, besides 'imitation,' which is of course necessary to them, possess a very considerable endowment of secretiveness. This is found not to be confined to actors, but farther observation has shewn that the same is the case with those who follow the imitative arts in general. It is the case at least with painters

and sculptors. Observations are not yet sufficiently numerous to shew if it extends to poets and musicians, but analogy would lead us to conclude that it may. In general, it is observed that secretiveness is necessary in order to give the artist the talent of *expression.* Imitation seems to give the power of copying the externals, but secretiveness is necessary to give a life and soul to the performance.

"But secretiveness is not merely useful in the arts—it is of essential service in the invention of plots, both in reality and in works of fiction.

"When secretiveness is found in combination with wit—or that power which gives the perception and love of the ridiculous—it becomes what is called *humour;* a quality which metaphysicians have often attempted to explain without success."

But we must forego the pleasure of making any further extracts on the uses of this faculty, which are laid down by Mr. Scott with equal plausibility and originality.

"III.—*On the effects of injuries of the Brain upon the manifestations of the Mind.* By Mr. Andrew Combe. (Read 9th January, 1823.)"

This is a highly interesting paper, the merits of which cannot be well conceived from a few detached extracts. The author, in reply to the assertions of Mr. *Rennel*, and other opponents, that every individual part of the brain specified by Gall and Spurzheim, has in its turn been destroyed, without injury to the faculty of which they call it the organ, shews—first, That the fact of the brain being composed of two similar parts or hemispheres, and consequently of the organs of all the faculties being double, has been overlooked and neglected by the opponents to the system—hence no argument can be deduced from an injury of one side of the brain, the other remaining sound and entire:—second, That the organs are not confined to the surface of the brain, but extend to the centre, or *medulla oblongata*, and of course the faculty cannot be entirely lost without the disease and destruction of the organ extending to the very centre or basis of the brain:—third, That to enable any person to speak with confidence of the state of a man's mind after a lesion of his brain, supposes a perfect knowledge of the number and nature of the primitive facul-

ties of the human mind, and also a previous knowledge of the healthy power of each in the particular case under consideration—whereas we know that the surgeon engaged in the hurry of general practice has no such information—and consequently no one can certify that all the powers of the mind are retained, when he is ignorant what these powers are. "The opponents never speak of any except *intellectual* faculties, and in expecting lesion of these powers, when, for instance, it is the cerebellum or posterior lobes of the brain alone, which are diseased, they at once display their own ignorance of the number and nature of the primitive faculties, and their most profound ignorance of the doctrines they impugn:"—fourth, That even supposing the number of primitive faculties to be known, we cannot place any dependence on cases and statements, unless made with a view especially to this physiological inquiry. The mere reply, by a patient, to any simple question about his health, though it may seem to justify the surgeon and attendants speaking of him as in the full possession of his senses, is no more to be received as evidence of his being able to think and reason with his accustomed energy and facility, than the mere fact of a gouty or rheumatic patient being able to walk across the room is to be considered as proof of his retaining or having recovered all his muscular strength.

Out of the twenty-nine cases of injury of the brain, quoted by Mr. Combe, many of which are referred to by Mr. Ferriar and the Edinburgh Reviewer, "*eighteen* expressly refer to injury of *one side only*. These require no remarks; for granting that none of the faculties were lost, there still remained the sound side to execute the functions. *Five* more expressly refer to injury or disease of the *cerebellum* and *fourth ventricle*, parts which have no immediate connexion with the exercise of the intellectual faculties. In two, the side is not mentioned, and another is *Billot's* case. In three more, the whole brain was extant, but altered in appearance."

We learn, however, from an attentive perusal of the cases

quoted, that not a single instance has been found in which the destruction of both organs has occurred, while the alleged manifestations existed.

"IV.—*Cases of Deficiency in the Power of Perceiving Colours.*"

"I.—*Remarks on the Faculty of Perceiving Colours.* By Dr. Butter, F. R. S. L. S. &c. (Read 28th November, 1822.)"

In this paper are detailed the particulars of the case of Mr. Robert Tucker, son of Dr. Tucker, of Ashburton, Devonshire, who at the age of seventeen discovered that he was unable to distinguish several of the primitive colours from each other. Yellow is the only one known by him to a certainty. "A difference in the shade of green he can distinguish, though not the green colour itself from the orange. Soldiers' scarlet coats appear red. Grass looks green"—though it is mistaken for orange on every other substance. "The colours of the rainbow, or of the moon, appear nearly the same, being two-fold—at least two distinct colours only are seen, which he calls *yellow* and *blue.*" Closing one eye and looking with the other made no difference in the results. His health has been good. This defect has not sprung from disease :—it has no relation to nyctalopia or amaurosis, only in its probable seat :—it is natural, not morbid. His eyes are well formed, and his vision is exceedingly acute, at any distance, or in any light.

Dr. Butter thinks that we must seek for the explanation of these peculiarities in physiological, and not in optical science, for the phenomena do not depend on the mechanical construction of Mr. Tucker's eyes.

"In comparing," says Dr. B. "Mr. *Robert Tucker's* cranium with casts, and with the plates in Dr. *Spurzheim's* book, I was forcibly struck with the flatness of his os frontis, at the place in the orbitary ridge, where the organ of colouring is said to be situated—and this flatness, it is well known, indicates a small development of the organ.

"II.—*Case of Deficiency in the Power of Perceiving and Distinguishing Colours, accompanied with a small develop-*

ment of the Organ, in Mr. James Milne, *brass founder in Edinburgh.* By Mr. George Combe. (Read 28th November, 1822.)"

Mr. Milne's grandfather, on the mother's side, had a deficiency in the power of perceiving colours, but could distinguish forms and distance easily. In himself and two brothers the imperfection appeared in a decided manner—while in his sisters, four in number, no trace of it is to be found, as they distinguish colours easily. He rather excels in distinguishing forms and proportions. By a cast of Mr. Milne's head it appears that the organ of colouring is decidedly deficient. At one of the meetings of the Society in Edinburgh, he and Mr. Gibson, landscape painter, were placed behind a screen at the door, and the head of each covered with a handkerchief, when more than half a dozen of gentlemen, who were strangers to both, named them respectively and correctly, by feeling their heads at the part indicated.

"V.—*Notice of a Case in which the Patient suddenly forgot the use of spoken and written Languages.* By Mr. Alexander Hood. (Read 23d January, 1822.)"

This is an exceedingly interesting communication. The patient, R. W. was a man of regular and sober habits, in the sixty-first year of his age, and by trade a blacksmith. Though his general health was good, he had been subject to severe headaches, which were uniformly referrible to the sockets of the eyes and eye-brows. After other diseased symptoms, as severe inflammation, pain and much swelling in the sub-maxillary and parotid glands, he experienced great pain in the left eye, which after a while abated, but the function of the organ was about this time unexpectedly lost. There is not any external sign of disease, and it seems to have been amaurosis from which the blindness proceeded.

On the evening of the 2d September, 1822, he suddenly began to speak incoherently, and became quite unintelligible to all those who were about him. On the next day "it was discovered that *he had forgotten the name of every object in*

nature. His recollection of things seemed to be unimpaired, but the *names* by which *men and things* are known, were entirely obliterated from his mind, or rather, he had lost the faculty by which they are called up at the control of the will. He was by no means inattentive, however, to what was going on—and he recognised friends and acquaintances, perhaps, as quickly as on any former occasion, but their names, or even his own, or his wife's name, or the names of any of his domestics, appeared to have no place in his recollection."

On the morning of the 4th September he put on his clothes and went out to the workshop, and gave Mr. Hood to understand that he was perfectly well in every respect, with the exception of some slight uneasiness referrible to the eyes and eyebrows. With judgment unimpaired, but memory for words a mere blank, he continued in this state to the middle of September, when he recovered the use of several vocables. By the last of December he could support conversation tolerably, though in many respects his memory was yet defective.

"The facts of this case appear to be," says Mr. Hood, "in many points of view extremely interesting, inasmuch as they seem to establish beyond the possibility of doubt, that the brain must consist of a congeries of organs, or parts, each serving to manifest a particular faculty, and that to one or more of these particular parts is appropriated the function of recollecting words or names. It appears also to be evident that this portion of the brain may have its function suspended or destroyed, without the judgment being impaired, or the recollection of facts, circumstances and events being effaced from the mind."

The pain in the case before us so uniformly referrible to the part of the head "situated above and behind the eye," the location of the organ of artificial language, seems to confirm the observations of Gall and Spurzheim on this subject.

"VI.—*Remarks on the Cerebral Development of King*

Robert Bruce, compared with his character as appearing from history. By Mr. William Scott."

A perusal of this paper shews us the assistance which phrenology may render to history and biography, by analyzing character, and correcting in a degree the misrepresentations of extravagant eulogium or mercenary asperity.

"VII.—*Report upon the Cast of Miss Clara Fisher.* By Mr. George Combe. (Read 26th December, 1820.)"

After some observations on the very great imitative powers of Miss Clara Fisher, and her peculiarly felicitous conception of some of Shakspeare's characters, as *Richard III. Shylock* and *Falstaff*, so that her age (only nine years) and diminutive stature are entirely forgotten—the writer of the paper before us, proceeds to remark on the uncommonly large size of her head in comparison with that of other children of a similar age—and adduces this fact in proof of the position, that great mental power is never found in concomitance with a small brain, even in early life. The opinion advanced in the essay of Mr. Scott, that *secretiveness*, not less than *imitation*, is an essential requisite for histrionic talent, is fully confirmed in the present case, for here both of these organs are large. "*Secretiveness* appears to give the power of suppressing and concealing the natural character, and thus aids the mind in assuming, by means of *imitation*, such other characters as are intended to be represented. *Ideality* adds splendour to the performance, for it infuses the spirit of poetry, the glow and colouring of fancy into the personation, and distinguishes it from mere mimicry."

But the effect with which these powers can be applied in representing particular characters, will depend on the degree in which the faculties are possessed in combination with them. "Hence, to constitute an accomplished actor, capable of sustaining a variety of parts, a general, full endowment of the mental organs is required."

"In Miss Clara Fisher we perceive all the general powers necessary for acting, supported by a high endowment of variety

of other faculties, calculated to give them eminent effect. In particular the elementary qualities constituting the character of *Richard,* are present in a high degree; and hence, perhaps, the cause of her representing that personage with peculiar excellence.

"The high and full forehead gives her the intellectual energy of that character. The immense *love of approbation, firmness,* and *cautiousness,* enable her to feel and express the ambition, the determination, the coolness of the tyrant. The *secretiveness* supplies the cunning, and the *combativeness* and *destructiveness,* the fire, and also the genuine obduracy of sentiment so characteristic of *Richard;* while *ideality* throws the colouring of poetry over the whole representation, averts disgust, and holds the mind subject, by an intense interest, to a being too diabolical otherwise to be looked upon without horror. Of course, the *benevolence,* the *justice,* the *adhesiveness* and other higher faculties, joined with the great reflective powers and *ideality,* render the real character of Miss Fisher very different from that indicated by her representation of *Richard.*"

The following particulars will not be uninteresting to our readers. Miss Fisher began to show her histrionic talent at four years of age—at one year old she distinguished airs in music. Her father says, that her verbal memory is so great, that she will learn one hundred lines in one hundred minutes. She is fond of play, but her father said that she liked the society of persons older than herself, and could not endure that of children of her own age. She has only lately (1820) learned to read—so that she is a child of nature, not of education.

"VIII.—*Case of J. G——, aged ten years.* By Mr. David Bridges, Jr. (Read 6th December, 1821.)"

This is the imperfect history of a boy of peculiarly marked cerebral development, by means of which, Mr. Combe was enabled on a first introduction, to give the striking features of his character. With *secretiveness, cautiousness,* and *acquisitiveness* very large, and *conscientiousness* and *veneration* small, he was prone to lying, pilfering and deceit, to such a degree, as to be untractable to many efforts to educate him. His father was a man of dissipated habits and indigent circumstances, but of considerable ta-

lents. His mother, whose character was not favourable, died when he was five years of age, in consequence of which circumstance, he was taken into the Charity Work House of Glasgow. His intellectual organs, *comparison*, *causality*, *wit*, *imitation*, *language and tune*, were all full, and *benevolence*, *attachment*, and *ideality*, were well developed. These three last, together with *cautiousness*, and his high intellect would, it was thought, afford means for supplying his deficiencies, and counteracting his tendencies to evil. "If left to his natural tendencies," says Mr. Combe, "he will probably turn out a very first rate swindler: if well educated, he may get through life without crime, and even with credit for his intellectual powers—but he will, with difficulty, be made amiable, sincere, and worthy of confidence."

"*Continuation of the Case of the boy J. G——.* By Mr. Geo. Combe, (Read 9th January, 1823.)"

Additional particulars are given of the conduct of this boy, after he was brought to Edinburgh, where he was placed at school previous to his being bound apprentice to Mr. Milne, brass founder. He absconded in February, 1823, and has not since been heard of.

"IX.—*On inferring Natural Dispositions and Talents from development of Brain.* By Mr. George Combe. (Read 11th April, 1822.)"

The author here tells us, that "the phrenologist in no case ventures to predicate, from the mere development, any thing more than simple natural talents and dispositions—and in every instance where a sketch, resembling that of actual character has been given, previous information has been afforded of the age, sphere of life, and education of the individual in question—and the conclusions have consisted of an estimate of the effects of these extrinsic causes operating upon and modifying, the direction of the original powers." But in other cases again, "the natural dispositions and talents are so decided, as to command and predominate over external circumstances, instead of being greatly modified by them. *Shakspeare*, and *Burns*, and

Bonaparte, for example, forced upon the world the impression of their natural powers, in opposition to the strongest external obstacles to their success."

Then follow, "I.—*Observations on Evidence in favour of Phrenology, afforded by Reports on the Cerebral Development of Executed Criminals, as indicated by their Skulls.* By Mr. George Combe. (Read 25th April, 1822.)"

"II.—*Report on the Development of James Gordon, executed at Dumfries*, 6*th June*, 1821, *for the murder of John Elliot, a Pedlar Boy.* By Mr. Robert Buchannan. (Read 25th April, 1822.)"

"III.—*Remarks on the Case of John Bellingham, the Assassin of Mr. Perceval.* By Sir George Stewart Mackenzie, Baronet. (Read 20th March, 1823.)"

"IV.—*Observations on the Cerebral Development and Dispositions and Talents of Mary Macinnes.* By Mr. George Combe. (Read 1st May, 1823.)"

In the casts of nearly thirty murderers, in the possession of the Society, collected from Paris, London, Nottingham, York, Dumfries, Glasgow and Edinburgh, "in every one of them," says Mr. Combe, "without a single exception, a large development of the animal organs in proportion to those of the intellectual and moral sentiments is found."

The following remarks of Sir G. S. Mackenzie, in his paper on Bellingham, are on questions of greatest moment to the peace and well being of society. "The difficulty, and it is one of great magnitude, which lies in the way of criminal legislation, and of the exercise of mercy in cases such as that we have been considering, is to ascertain where, in the descending scale of intellect, responsibility ends. Until the truth of phrenology be universally assented to, there can be no hope of the removal of this difficulty—nor will due effect be given to the establishment of houses of refuge, penitentiaries and the like. But whenever the world shall have shaken off prejudice, whenever it shall condescend to put phrenology to those tests that have been freely offered by its advocates, then we may expect to see the exertions of the benevolent crowded with success—the re-

formation of criminals judiciously attempted—punishment properly regulated, and mercy extended without fear of abuse."

"X.—*On the mode of studying the Natural Dispositions and Instincts of the Lower Animals.* By Mr. Andrew Carmichael. (Read 8th January, 1821.)"

"XI.—*Phrenological Analysis of some of the Maxims of* La Rochefoucault. By Mr. George Combe. (Read 1st May, 1823.)"

This analysis shows that Rochefoucault, like many other philosophers and moralists, in speaking for himself, thought he spake for human nature—and it accounts for the different views taken of these maxims by different readers—approving or dissenting according as their natural constitution resembled or was dissimilar to that of the writer.

"XII.—*Observations on Dr.* Barclay's *Objections to Phrenology.* By Mr. Andrew Combe. (Read 3d April, 1823.)"

This is a reply, and we think a very satisfactory one, to the strictures on Phrenology in Dr. Barclay's work on Life and Organization. But as it is an examination of the arguments of Dr. B. for he advances no facts, our readers will readily excuse us for not entering into a detail of it here, inasmuch as it must necessarily lead us to retrace ground already gone over.

"XIII.—*On the Phrenology of Hindostan.* By Dr. George Murray Paterson. (Read 1st May, 1823.)"

We can hardly do justice to the merits of this highly interesting memoir by a brief abstract.

The "*Knowing Faculties*" in the phrenological division, are less active in the Hindoo, while it is maintained "from an immense mass of observations, that the organs of *individuality*, *number* and *language*, are comparatively the most fully developed in this genus of faculties. It is by *individuality* that a Hindoo is always so consciously alive to the objects around him—that is to say, to their mere existence, not to their relations." The organs of *form*, *locality* and *tune*, are in general slightly developed in the Hindoo, and

hence their knowledge of forms and memory of places are very bad, and their taste for music very indifferent—their songs being destitute of melody, and a mere monotony of recitation.

"*Reflecting Faculties.* That portion of the frontal bone which indicates the size of the organ of *comparison* is generally the most fully developed in this genus of faculties in the Hindoo. It is mentally manifested by them in their strong propensity for similitudes, not in their powers of pointing out differences. The largeness of this organ, with a small development of *causality* is the reason why the Hindostanee language abounds so much in metaphor, and is so sparing of philosophical expressions of discrimination. The organ of causality is most slightly developed."

That portion of the bone which indicates the organ of *wit*, slopes off, and the talent is not evidenced by this people. The organ of *imitation* is moderately developed.

Sentiments. Dr. Paterson is of opinion that neither the organ of *benevolence* or *veneration* is full in the Hindoo. *Ideality* is rather more than ordinarily developed. "Their poetical effusions are highly inflated, florid and allegorical, but devoid of any sentiment to affect the heart."

The uniformity of the size of *firmness* is not well fixed. The Hindoo character on this point, is that of fickleness, according to Dr. Paterson.

The organs of *self-esteem* and *love of approbation* are fully developed in this nation, and the corresponding faculties are manifested in them with an energy independent of external circumstances.

Propensities.—*Amativeness.* The Hindoo cerebellum is uniformly well developed. The manifestations of the fulness and activity of this organ, as found in the well known jealousy of this nation, originating "merely in a disagreeable affection of their *amativeness*, the great activity of which, conjoined with *self-esteem*, *love of approbation*, and *acquisitiveness*, all of them highly selfish propensities, is well known to give the tendency to jealousy in love. Polygamy and unnatural desires abound. The swarms of children in

the villages and towns, strike every stranger with astonishment."

Philo-progenitiveness. This organ is uniformly very fully developed in the Hindoo, and according to Dr. Paterson's observations, is possessed by males and females in the same proportion. "It is manifested by the Hindoos in their predilection for domestic quiet—the happiness they seem to feel when surrounded by their children—in their terms of endearment—in the spirit of their lullabies, and in their frequent and ardent embraces."

"*Constructiveness.* At the assigned localities of this organ the bones are convex in the slightest degree." During his earlier phrenological studies in India, Dr. Paterson was induced to look upon this organ as generally well developed; but in discovering his error, found at the same time a beautiful confirmation of the functions of the organ being perfectly ascertained. His observations at Fort Monghyr, a small town on the banks of the Ganges, tended to prove that the organ of *constructiveness* was more than fully developed—and it was so mentioned in his first report to the Asiatic Society at Calcutta. But he was not aware when he left the town of Monghyr, that it had been long noted for its superiority in cutlery, gun making, tools, and a great variety of utensils and articles that are the result of mechanical construction.

"*Combativeness* and *Destructiveness.* The bone at the locality assigned to the organ of *combativeness* is nearly flat, while at that assigned to the organ of *destructiveness*, the bone is either quite flat, or indicates a slight degree of concavity." We all know the disposition of the Hindoo in these respects—his aversion to fighting, and to destroying animal life—"he is scarcely a carniverous animal, and he has a tender and delicate care over the life and feeling of the most insignificant insect, or animalcule."

"*Acquisitiveness* and *Secretiveness.*" The parietal bone is most fully developed in the regions which are the localities of the organs now under consideration. How then is this greater cerebral development manifested by the mind

of the Hindoo? "I might answer this question," says Dr. Paterson, "in a very few words, by replying, that Hindoo was only another term for falsehood—and that love of money is his darling propensity. But I will particularize. A Hindoo will gratify his love of secrecy and his desire of gain at the same time. How does he pilfer from his master's sugarcandy, his tea, or his money? He will not steal or secrete a pound of sugar, or a pound of tea, or twenty rupees. No—he will filch a small bit of sugarcandy at tea, a second at tiffin, (Indian lunch) and a third at dinner; these he will secrete till they accumulate, and then he will sell them. In the same way he will treat the tea and the *pice*, (copper coins) and any other article that will admit of a similar insensible mode of abstraction. A Hindoo is even proud of his accomplishment in the art of deceiving. Sir *William Jones* has been heard to say, that in the bazars of Calcutta he could purchase affidavits cheaper than asparagus."

"There is no field," continues Dr. P. "so ample for an inquiry into Oriental phrenology as the bazars of Calcutta, where natives from all the provinces of Hindostan, and from all quarters of Asia, are to be found. I have examined Hindoos of every province from Cashmere to Cape Comorin, and from the banks of the Indus to the forests of Aracan—and the sum of my inductions from the immense mass of observations I have made, tends to prove that the brain is superiorly organized in those provinces of Hindostan that have been longest subjected to the invasions of the Mahomedans," compared with the pure Hindoo stock.

Here we conclude our extracts from the Transactions of the Phrenological Society of Edinburgh—and we hope they have been sufficiently copious and connected to shew the scope and aim of the science of phrenology. We now see that, while pursued in all its details, it affords inexhaustible themes for inquiry, it may at the same time be brought to bear on all the dearest interests of humanity. It is "the proper study of mankind," which, like mysteries the most sacred, and truths the most sublime, may still be sneered

at as visionary and absurd, by learned prejudice or licensed ignorance, but cannot fail, ere long, to arrest the attention and engage the admiration of every thinking mind. To bring about more promptly this favourable consummation, a Phrenological Journal is now published quarterly in Edinburgh. "It is intended to serve as an expeditious medium for communicating to the public a fund of information on the science, of great importance in removing prejudices, exciting inquiry, and diffusing a knowledge of the subject. The conductors intend in an especial manner, to employ its pages in disabusing the public of the misrepresentations daily propogated against phrenology and phrenologists, and turning the tide of ridicule in the direction in which it ought naturally to flow—namely, against the absurd opponents of demonstrable truths, and the bigotted supporters of antiquated errors."*

But let it not be imagined that this struggle against ancient prejudices and modern truths, is carried on within the walls of fair Edina alone. Science, hitherto boasting of our land as an asylum from all intolerance, finds European opposition echoed from our shores and sounded in the valleys of the West. But each year renders it fainter, and we shall soon hear it gradually dying away, leaving behind it, like the summer gust, a fairer and a calmer scene.

We hope to stand excused by the worthy Professor of Transylvania University for not having sooner noticed his "Elements of Phrenology"—owing to our desire to make our readers acquainted with the contents of the "Transactions"—and we can now assure them that under this modest title of Elements, he has condensed much of the interesting and instructive matter of the science. We congratulate him on his having, with few exceptions, adhered so closely to his record, and given little opportunity for envious criticism, spider-like, to clip the wings of his imagination. Sustained by the consciousness of the purity of his motives, in lending the aid of his talents and literary

* The first number appeared in November last.

reputation, to the science of phrenology, he will estimate at their true value the accusations brought against him, "of irreligion in every shape, and under every appellation—*materialism*, *deism* and *atheism*."

On this said point of materialism, we like much the ideas of the Doctor who holds the following language. "Pure *spiritualism* is as rank heresy, as pure *materialism*. The reason is obvious. Each hypothesis is a departure from truth, and calculated alike to degrade one kind of substance *below*, and elevate another *above* its appropriate rank.—Each hypothesis takes from nature the simplicity, harmony, and adaptation which God has established. Thus far I speak in relation to the *universe*, as a *connected whole*.

"To man as a systematized part of it, similar observations may be correctly applied. He, like the universe itself, is composed of two created substances, *matter* and *spirit*. To make him what he is, those two substances are *equally essential*. Remove either of them, he is man no longer. Take away his spirit, he is reduced to a mass incapable alike of perception, volition or reason. Take away his material portion, and we know not what he is—a spirit still—'the ghost of what he was;' but under what form or mode of existence and action, we are perfectly ignorant. On this subject revelation *has not* fully and distinctly informed us, and human reason *cannot*."

Among the "Fundamental Propositions" laid down by our author are the following:

"Man is a *compound* being, consisting of *soul* and *body*, or *simple* spirit and *organized* matter."

"The brain is the organ of the intellect—the necessary associate and co-partner of mind in *every intellectual operation*."

"The brain is not a simple but a *compound* or *multiplex* organ."

"To the existence and exercise of each original *propensity*, *sentiment* and *intellectual faculty*, a specific cerebral organ is necessary."

"Phrenology further maintains, that education can *add*

no *new* faculties, but only cultivate and regulate those derived from nature."

In Section I, the connexion between mind and matter, and their relative importance are very properly discussed—and the common vague notions on the omnipotence of mind, and the nothingness or worthlessness of matter, freely examined.

"While I do homage to the *mind* of man," says Dr. C. "I do little less to the substance and exquisite structure of his *body*. Nor can I estimate very highly either the knowledge or the feeling of that individual, who coldly refuses to unite with me in sentiment. I can cherish no sympathies with that philosophy which makes a merit of *libelling* the body of man—of representing it as a tenement unworthy of his mind, and thus calumniating the material *chef d'œuvre* of God on earth."

"To study man either as a *feeling* or a *rational* being, we must study him in his *compound character*. To attribute feeling either to his *mind* alone, or his *matter* alone, is alike gratuitous and unphilosophical. Of neither of these substances, *exclusively*, is that property predicable. It is the offspring of both *in a state of union*."

In Section II, the question propounded for solution—"Can the mind of man as a simple indivisible substance, *a mere unit in essence*, possess of *itself*, a plurality of faculties?" is answered in the negative, and it is shown by a variety of analogical illustrations, that "the mind although simple in its substance and its power, acting on and aided by *diversified material organs*, achieves *a variety of intellectual processes*." In the same manner that the vital principle, a unit both in nature and power, exhibits variety and complication of phenomena in proportion to the extent and variety of organization in the animal frame.

Section III and IV, treat of the brain as the organ of the intellect, and refute the objections to this position.

In Section V, it is shown that "the *brain is not a simple organ, but an aggregation of several.*"

In Section VI, we have the usual phrenological division,

of the faculties of the mind, which we forbear repeating here, as we have more than once pressed it on the attention of the readers of this Journal.

The author very properly tells us at the very beginning of the "Elements," that this science is divided into phrenology proper, and craniology.

The *first* treats of the connexion and reciprocal influence of the mind and the brain.

The *second*, of the quantity and figure of the brain, as manifested by the size and form of the cranium.

In another place: "We are told by individuals who wish to bring the science into disrepute, that phrenology may be *true* and craniology *false*.

"This is a mistake. Phrenology may be better understood than craniology—but they are indissolubly united, and must stand or fall together. Phrenology treats of that which is the *cause*, craniology of that which is the *inevitable* effect. As well may you, in any other instance as this, predicate *truth* of the *cause*, and *fallacy* of the *effect*."

To persons not conversant with anatomy, and who do not see what the examination of the skull, or craniology, has to do with determining the difficulties of the mind—or why it is a part, and an essential one, of the science of phrenology—we would suggest the comparison of vegetable physiology with animal physiology. In speaking of a tree for example, its trunk, branches, fruit, &c. we describe its bark, which is the outer covering of the wood, and, allowance made for some knots or excrescences, it gives the precise size and form of the latter—presenting more surface, and growing larger in proportion to the growth of the wood internally. So in speaking of man, his body, senses, and mind, we describe his skull, which is the hard bony covering to the brain, and yet grows and expands in proportion to the growth and expansion of the latter. The observation on the bark is then in the study of the nature and properties of a tree—what craniology is in the study of the powers and faculties of man. By the bark we know the size of the wood beneath—by the cranium or skull, we learn

the size of the brain. The knowledge of either of these facts, viewed isolatedly, would be of little avail. Taken in connexion with all the other accompanying phenomena which we learn by observation and experience, they become of the utmost importance. Thus, with bark of a certain size, colour, and smoothness, or roughness, we associate the ideas of a particular kind of wood, &c. peculiarity in leaves, fruits and flowers—as with a skull of known proportions and prominences, we associate the ideas of a brain of a certain magnitude, and peculiar and specific faculties and mental functions.

In Section VII, Dr. Caldwell refutes the accusations brought against phrenology, of its favouring *materialism*, *fatalism* and *the legitimacy of crime*, and shows (as all the other defenders of the system have found no difficulty in doing) the futility of allegations advanced in ignorance, misconception, or wilful misrepresentations. We are purposely explicit in this expression of our fixed opinion, to the correctness of which we have as yet met with no exception, and our experience has not been by any means limited to a few individuals, or persons of particular professions or modes of thinking.

Section VIII, of the work before us, is taken up with miscellaneous remaks, some of which are replies to the objections urged by Dr. Warren of Boston. On the latter point, we readily refer our readers to the very able, and we think conclusive paper of our friend Dr. Coates, read before the Phrenological Society of this city, and published in a former number of this Journal.

Upon the whole, we can safely recommend to general attention and perusal, the "Elements of Phrenology," as a clear and satisfactory manual of the science, and express our hopes for its more extended circulation.

We cannot forbear in conclusion, protesting against a too prevalent notion of the study of phrenology being restricted to, and its utility of application only felt by, the medical profession. As an inquiry into the philosophy of the human mind, it must interest every profession and every in-

dividual, and not one of its least advantages and claims of superiority over all other systems, is the facility with which any person of even a limited capacity, can prosecute it, to the extent at least of obtaining a conviction of its truth, and enabling him to understand the more extended observations and practical deductions of the experienced and initiated. We have seen that in Edinburgh, the gentleman* who, by his talents and skill, has most largely contributed to the improvement and spread of phrenology, is a *writer to the signet*—and in fact, after a little elementary knowledge of the connexion between the skull and brain, and of some bony prominences in the former which might otherwise mislead—every person, of common observation, is as competent a judge, and as able to accumulate facts, and draw the inferences in the new science, as the physician. It is a sufficient cause of triumph to our profession, for two of its members to have been introducers of sound and practical philosophy at the commencement of the nineteenth, as for one, whose first studies were medical, to have brought about such a salutary reform in metaphysical science at the end of the seventeenth century. Nor should it be forgotten, that some of the most ingenious views of Montesquieu on the modifications imprinted on man in his physical and moral nature, by climate and situation, are derived almost exclusively from the writings of the great Father of medicine.

* Mr. George Combe.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

ANATOMY AND PHYSIOLOGY.

On the Influence of the Nervous System on Digestion. By MM. Breschet, H. Milne Edwards, and Vavasseur.—In an interesting *Mémoire* by these gentlemen, lately read before the *Société Philomatique* of Paris, several experiments are detailed, which were instituted for the purpose of investigating the influence possessed by the nervous system on the functions of digestion: the following are the conclusions deduced, which, it will be observed, differ but little from those at which Dr. Wilson Philip had previously arrived.

1st, Simple section of the two pneumo-gastric nerves in the region of the neck, without loss of substance, and without separating the cut extremities, does not prevent digestion from taking place, but merely retards it in an evident manner.

2dly, Section of these nerves, with loss of substance, diminishes considerably, and much more than simple section, the digestive action of the stomach, but it does not appear to abolish it completely.

3dly, Section or destruction of a part of the spinal marrow, or ablation of a portion of the brain, acts in the same manner on the changes which the food undergoes in the stomach.

4thly, Narcotics, administered so as to produce coma, equally diminish the energy of the digestive powers.

5thly, It results, consequently, that every thing which diminishes the amount of nervous influence, transmitted to the stomach, weakens the digestive action.

6thly, and finally, When digestion is almost completely suspended by the section, with loss of substance, of the pneumogastric nerves, the digestive action of the stomach may be reestablished, and the food contained therein be converted into chyle, by means of the galvanic influence, with almost as much rapidity, and as perfectly, at least in appearance, as under ordinary circumstances.—*Archives Générales de Médecine, Août,* 1823.

On the Decussation of the Optic Nerves.—Vicq D'Azyr had found, on examining with the microscope, a horizontal section of the optic nerves of the human subject, after it had been hardened by immersion in alcohol—that the medullary fibres, occupying the exterior side of the optic nerve, proceeded in a direct manner from the optic thalamus to the eye of the same side—and that the place of union presents an homogeneous tissue. The *Wenzels* came nearly to a similar conclusion from their observations, but remarked, in addition, that while the fibres of the exterior side of the nerve go immediately to the eye of the same side, those fibres, placed in its interior side, are directed obliquely towards the other nerve, without, however, any crossing of fibres being manifest at the point where the junction of both nerves takes place.

M. Treviranus has, in a great measure, confirmed these observations, on the male *simia aygula.* The nerves and brain were left during some months in alcohol, and afterwards kept some time in caustic potash to soften them. Having thus prepared them, he submitted them to a careful dissection, when he made out, with the aid of a microscope, that the external fibres of the upper side of each were continued from their cerebral extremity to that in the eye, without uniting themselves to those of the other side—whilst, on the contrary, the internal and inferior fibres of one nerve went to the other side, and united with the fibres of the opposite nerve. It was difficult to determine whether any of the fibres actually passed from one side to the other. He thought, however, that some of the fibres did so. The internal fibres, thus interlacing together, were evidently more numerous than the external fibres which ran to the eye, without uniting with those of the opposite nerve.—*Journal Complémentaire, Oct.* 1823.

On the specific Action of certain Substances on particular Portions of the Encephalon. By M. Flourens.—It is considered that certain substances introduced into the digestive organs, or into the vascular system, act chiefly or specifically on the brain. But it has not yet been explained how these substances, acting all on the same organ, produce, nevertheless, phenomena essentially different. M. Flourens, whose former experiments tend to show that the encephalon is composed of several parts, performing essentially distinct functions, entertained the idea of ascertaining, by direct experiments, the cause of the diversity of effect just alluded to, in the proper or specific action of each of these substances on each of the differents parts of the brain.

It appears from these experiments of M. Flourens :—

1st, That, up to a determinate dose, opium acts exclusively

on the cerebral lobes; belladonna on the corpora quadrigemina; and alcohol on the cerebellum.

2d, That the physical results of the action of each of these substances on each of these parts are absolutely the same as those from mechanical lesion of these parts. As, for example, when a substance acts only on the lobes of the cerebrum, the functions of those lobes are alone injured: when on the cerebellum solely, those of this organ are deranged: and when on the corpora quadrigemina, those of this organ are injured, &c.

3d, That the action of each substance always leaves, after death, and points out, even during life, signs which may serve to distinguish the affected organ from others.

4th, That camphor, æthers, &c. act in a manner analogous to alcohol; the watery extracts of henbane and bitter lettuce, &c. in a way similar to opium, &c.

The experiments on which these inferences are founded have been repeated before MM. Cuvier, De Humboldt, Portal, Dulong, and Dumeril, who are commissioned by the Institute to report upon the *Mémoire* of M. Flourens.—*Rév. Méd. Jan.* 1824.

Respiration of the Fœtus.—M. Geoffroy-Saint-Hilaire has lately communicated to the Academie des Sciences a memoir on this subject. This distinguished naturalist, proceeding upon the principle that there is no organization without the combination of a fluid capable of being assimilated, and no assimilation without oxygenation, or previous respiration, has endeavoured to demonstrate—

1st, That there exists a respirable gas in the waters of the amnios, the presence of which seems to be indicated by the experiments of MM. Chevreuil and Lassaigne.

2d, That the fœtus does, in the same manner as aquatic insects, separate the air contained in the circumambient fluid by all its pores, like so many tracheæ; and further, that it brings into contact with the air thus obtained the venous blood, which circulates in the minutest capillaries of the dermis.

3d, That the contraction of the womb and abdominal muscles produce a sufficient degree of compression to effect this phenomenon during ordinary respiration.

Peculiarity with respect to the Teeth of the Guinea Pig.—M. Rousseau, in a letter addressed to the Royal Academy of Medicine, asserts that the guinea pig loses the first *dens molaris* four or five days before its birth, and that it is absorbed in the uterus. The animal is born with the teeth already developed, and sufficiently strong for the purpose of chewing.—*Bulletin des Sciences Medicales.*

MORBID ANATOMY.

Obliteration of the Œsophagus, in consequence of Inflammation.—A young man, aged twenty-four years, was admitted into the Hotel Dieu at Lyons, having swallowed a glass of aquafortis two years previously. He escaped from the first symptoms, which were violent, but a degree of inflammation remained in the pharynx and œsophagus, which prevented him for a long time from being able to swallow any thing except a little milk and water. The power of swallowing was afterwards lost, and the fluid could only be carried into the stomach by means of a hollow bougie—a still more complete stricture of the œsophagus did not permit even the sound to pass. In this state the patient presented himself to M. Dupuy, on the 18th of May, 1822. The impossibility of introducing food into the stomach, induced him to have recourse to nutritive enemata of soup. The unfortunate patient, tormented by hunger which could not be appeased, was wretchedly emaciated, and affected with violent fever—his eyes were sunk, his tongue red, his belly retracted, and he had continual hiccough. At last, on the 28th he died of inanition, in the most acute anguish. On opening the body, the œsophagus was found completely obliterated for four inches at its inferior extremity—the stomach was slightly inflamed. It is suggested that, if it had been possible to have left the sound in the œsophagus, the power of introducing nourishment might have been retained, and the life of the patient prolonged.—*Bulletins de la Société Medicale d'Emulation de Paris*, Juin.

SURGERY.

Case of Elongation of the Uvula, producing Symptoms of Chronic Pneumonia.—Madam G—, aged thirty, born of healthy parents, had suffered no severe illness from her infancy, when, in the month of January 1822, she became affected with slight cough, to which she at first paid little attention, attributing it to the dampness of the atmosphere and her exposure to cold. This lady was the mother of two children, who were exempt from disease, although of a scrofulous constitution. Nothing announced a predisposition to chronic disease of the respiratory organs—nevertheless, her cough gradually increased until the month of April, when her ordinary medical attendant was consulted. He prescribed various pectoral remedies, without avail: the cough made new progress, and in the month of August, Madame G— was supposed to be affected with chronic inflammation of the lungs, accompanied with tubercles already de-

veloped. Various active means were had recourse to, calculated to retard the progress of the disorganization.

M. Cuynat was called in on the 20th of December, 1822, when he observed the following symptoms:—the respiration was constrained, and there existed considerable constriction of the chest, within the cavity of which were felt sharp flying pains, which were increased during the cough and full inspiration. The patient made continual efforts either to swallow or to expel the mucus of the throat—a fixed pain, accompanied with tickling, existed in the larynx—the appetite was almost gone—the tongue was sometimes white, and sometimes natural—the countenance pale—emaciation extreme. The languor both of body and mind of Madame G—, seemed to announce the profound lesion of some important organ. The chest, however, examined with much care, was sufficiently sonorous at every part, except the upper, where the sound appeared rather dull. The pulse was sometimes small and unequal, and at others full and frequent—it often passed from one of these states to the other in the space of half an hour. Having examined the fauces, M. Cuynat observed that the uvula was elongated, and rested on the root of the tongue, being the seat of a serous enlargement—and he conceived that all the evils experienced by the patient arose from this cause. He discontinued the use of all internal remedies, and proposed the removal of the superabundant portion of the uvula, as the only means of getting rid of the symptoms. This being agreed upon, the operation was performed on the following day.

The patient was seated opposite a window, with the head supported against the chest of an assistant, and the jaws were kept apart by a roll of linen placed between the molar teeth. The operator then laid hold of the uvula with the pincers, and, pulling it gently, cut off a sufficiently large portion with a blunt-point bistoury. No considerable bleeding followed the operation, which was attended with little pain—and the wound was healed under the use of a gargle made of wine and honey, which restored its natural tone to the velum of the palate. The lady entirely recovered.—*Revue Médicale,* September.*

Application of the Stethoscope to the Diagnosis of Fractures.—M. Lisfranc, the well known lecturer on operative surgery at Paris, has completely succeeded in realizing a conjecture started some time ago by Laennec, with regard to the applicability of

* It is really astonishing that the above should be given as original information. When will Europeans shew a disposition to do us justice? The fact of an elongated uvula producing pulmonic irritation, and the truncation of it constituting the cure, has, for several years, been known in this country, and repeatedly published in our journals.—Editor.

his stethoscope to the diagnosis of fractures. With the aid of this instrument, he avers that no surgeon can ever remain in doubt as to the existence of a fracture in any part of the body, except the head. The tumefaction around the injury can never be so considerable as to obscure the crepitation entirely—and the slightest possible movements are sufficient to produce the requisite sound The following general rules have been established by frequent observation, both on the dead and on the living body. 1. The instrument may be applied over the seat of fracture with or without the end-piece—but the farther it is removed from the seat of injury, the sound is the more distinct when the end-pieces are removed. 2. When the bone is near the surface, the sound is always most distinct—the slightest motion elicits it—and it is most sensible just over the fracture. Hence they may thus discover the precise seat of the injury. 3. The crepitation diminishes as the instrument recedes from the fracture, yet may be felt at a very great distance. 4. When the bone rides, the sound is less obvious—but it becomes more distinct after extension and counter-extension. 5 The crepitation of compact bones gives a sharp, strong crackling, even sometimes so loud as to grate upon the ear. 6. That of spongy bones resembles the action of a file on such a substance as pumice, interrupted, however, by occasional sharp crackling. 7. Oblique fractures crepitate more distinctly than those that are transverse. 8. If liquids are effused round the broken ends, a sound is superadded, like that of the foot when thrust into an old shoe soaked with water. 9. When the fracture is complicated with splinters, the crepitation is united with a crackling as of several cornered bodies rubbing each other. 10. When it is complicated with laceration of the soft parts, the crepitation is united with a sound like that of a person breathing forcibly with the mouth wide open. 11. Dislocations give a very obscure dead sound, almost confined to the seat of the displacement. 12. The sliding of the tendons in their sheaths causes a full dead sort of shock, quite different from crepitation.

The ingenious author maintains that two advantages attend this application of the stethoscope. In the first place, some fractures will be at once detected, which can be recognised in no other way—and secondly, fractures of every sort may be easily and accurately recognised, with far less pain to the patient. Although we have not yet made trial of the stethoscope for this purpose, yet from what we know of its utility in pectoral diseases, and of the common principles of acoustics, no doubt can be entertained of the correctness of M. Lisfrac's experiments. It is only necessary to warn the reader, that in employing the instrument of Laennec, either for this or any other purpose, he must not expect to succeed at the first attempt.

To use it successfully requires considerable previous study, and perhaps also some tuition, a fact which never seems to occur to the numerous practitioners in our country, who neglect and despise it, without having taken any pains to appreciate its merits. M. Lisfranc has also applied it to the detection of urinary calculi, of biliary calculi, and of hydarthrosis. The first of these applications is useless—the fingers which hold the sound being just as fit for the purpose as the stethoscope held over the pubis. Out of many trials, the author detected the presence of biliary calculi in one instance only. Its use in hydarthrosis is obvious.—*Arch. Gén. de Méd. Aout,* 1823, ii. 631.

Case in which Extirpation of the Parotid Gland was performed by M. Beclard. Reported by M. Berard.—On account of the importance of this case, and the infrequency of the operation which was performed in it, we will give the particulars as fully as our limits will permit.

" L. F. Clout, a paper stainer, was admitted into the Hospital '*La Pitié*' on the 19th of August, 1823, on account of a scirrhous ulceration of the right parotid gland. This man was aged forty-seven years, of an apparently good constitution, and of a sanguineo-nervous temperament. The disease had commenced eight years before; but, from being long indolent, and comparatively small, it had rapidly increased, and become the seat of lancinating pains: it had also lost its mobility. On admission into the hospital, this cancerous tumour possessed a very considerable elevation. At its superior margin it raised the lobe of the ear, and appeared to involve the cartilaginous portion of the auditory canal. It extended downwards more than an inch from the angle of the jaw—backwards it adhered to the sterno-mastoid muscle, and its anterior portion covered a great portion of the masseter. It was ulcerated in two situations, and had but little motion. There was no appearance of cancerous cachexia. The patient desired an operation, and M. Béclard performed it in the following manner:—

"The patient having been placed on his left side, the tumour was inclosed by two curved incisions, the one made at the inferior and posterior part, the other at the anterior and superior part of its circumference. That part of the tumour placed over the masseter was first dissected off, from before backwards, with sufficient ease. It was next attempted to detach it from below upwards—but a projection of its substance plunged deeply behind and beneath the internal pterigoïd. To endeavour to remove this portion of the scirrhus at the commencement with the rest of the tumour, would be to expose the operator to the risk of hemorrhage, which might be difficult to repress during the operation—M. Béclard therefore decided to dissect up-

wards by striking the bistoury into the structure of the tumour itself, on a level with the projection, whilst the instrument divided before and behind the cellular tissue connecting it to the adjoining parts. Half the inferior circumference of the cartilage contributing to form the auditory canal, which was enveloped in the diseased part of the parotid adjoining, was removed with it in this first dissection. Numerous arteries were tied at this stage of the operation, and M. Béclard continued the extirpation of the rest of the tumour. A portion of the anterior margin and internal surface of the sterno-mastoid, being converted into a scirrhous substance, was excised with the bistoury. The projection situated behind the jaw was removed in successive slices—nearly the whole scirrhous mass was already dissected away in this manner, when a large jet of arterial blood announced the lesion of the external carotid, or the division of one of its principal branches. M. Béclard placed the fore-finger of his left hand on the place whence the hemorrhage proceeded, seized the bleeding vessel with a forceps, and passed a needle with a double ligature around it—an assistant tied the vessel above and below the wound in it, which was lateral. The artery was held forwards and outwards whilst he completed the extirpation of that part of the tumour which remained in the pit formed by the ramus of the jaw. One small projection of the tumour, placed before the cervical vertebræ, was only left, on account of its proximity to the internal jugular vein. M. Béclard contented himself with passing two ligatures beneath this part, by means of a needle, and with tying the one at its superior, the other at its inferior extremity.

"The considerable wound which remained after this operation presented, at its anterior part, the masseter as if dissected, and the labial artery denuded but not divided—at its posterior part, the mastoid apophysis, and the sterno-mastoid, with its interior and anterior portion removed—internally, the styloid apophysis, the external carotid surrounded with two ligatures, the stylo-hyoide muscle, and the digastric—and the small portion of the tumour which was tied formed the bottom of the wound, which opened upwards into the meatus auditorius externus. The wound was dressed forthwith.

"The extirpated tumour presented a scirrhous texture, mixed with a small portion of tuberculous matter. It was impossible to distinguish the structure proper to the gland itself.

"No particular occurrence took place during the first days of the treatment. All the right side of the face of the patient remained a stranger to any sort of expression, except what was occasioned by the actions of the left side producing some degree of motion in the soft parts of the right. The right eye remained continually open, which, owing to the irritation and

dryness of the conjunctiva thus occasioned, gave rise to a slight but obstinate ophthalmia. At the period of the suppuration of the wound, the patient experienced deafness of the same side, owing either to inflammation having been propogated to the internal membrane of the ear, or to the quantity of the discharge and swelling of the adjoining parts. The suppuration was going on kindly, and healthy granulations covered the wound, when, on the twelfth day, the patient experienced rigours, followed by heat and fever. Phlegmonous erysipelas attacked the surrounding parts, and was followed with great delirium. General and local bleeding, during the three following days, caused but slight amendment. After this period, the erysipelas on the face terminated by desquamation; but an abscess formed deep below the right trapezius muscle. The pulse remained frequent, and the derangement of the mental faculties continued. For several days the discharge was excessive. A counter-opening was made, and graduated compression was applied, which occasioned adhesion of the parietes of the abscess. The ligatures placed on the external carotid, and that part of the tumour which was tied, came away. The wound was approaching to entire cicatrization, the fever subsided, and the strength and appetite returned: but to the preceding delirium succeeded taciturnity, which was only broken by paroxysms of rage—mental alienation had supervened to the febrile delirium.

"Three months after the operation, the wound was closed, unless near the ear, where it had assumed a character denoting a return of the cancer. The patient was still maniacal, and seemed affected with a chronic inflammation of the membranes of the brain. He died three months and three weeks after the operation.

"On *dissection*, the external carotid artery was observed to terminate in cellular tissue, resulting from the cicatrization of the wound. There appeared no vestige of the parotid. The internal jugular vein was obliterated at the same height, and seemed to commence anew lower down by communicating with the superficial branches. The corresponding lateral sinus was not obliterated. Some pus was found in the meatus auditorius externus. The membrane of the tympanum was sound. There was a marked injection of the pia mater, and of the choroid, which was redder than the choroid plexus. A serosity was found in the ventricles, suspending particles similar to those deposited by some red wines."—*Archives Générales, Jan.* 1824.

MIDWIFERY.

On the local Application of Belladonna in Puerperal Convulsions. By M. Chaussier.—This eminent physiologist and ac-

coucheur, after describing the state of the uterus during this very dangerous disease, and pointing out the curative means which should be employed in it, takes particular notice of the local application of belladonna. He considers that the chief obstacle to delivery consists in the spasmodic constriction and resistance of the neck and orifice of the uterus. With a view of removing this, and, at the same time, of remedying the local plethora or congestion to which the nervous system is subjected, he recommends the active means (depletions) usually inculcated in this country; with revulsants to the lower extremities, cold applications to the head, emollient and relaxant enemas, and properly conducted endeavours to effect delivery. In order to subdue the spasmodic constriction of the neck and orifice of the uterus more particularly, and thus accomplish the last-mentiontioned purpose, M. Chaussier has been in the habit of employing the belladonna in the form of ointment, with very great success. This ointment consists of two drachms of the extract of belladonna, moistened with a little distilled water, and incorporated by trituration with an ounce of simple cerate or prepared lard. He enjoins it to be applied directly to the orifice of the uterus; and, in order to accomplish this, he employs a small syringe, rounded at its extremity, with an aperture there sufficiently large to admit the point of the little finger. Having drawn back the piston, as much of the ointment as is equal to a small nut is to be placed in the aperture of the syringe, which, by the direction of the finger, is to be carried to the orifice of the uterus, with which, by pushing the piston, the ointment comes in immediate contact. The os uteri generally becomes dilated in about thirty or forty minutes after this application, without impeding the action of the fundus or body of this viscus. This medicine has been employed since 1811 by M. Chaussier, and, under his directions, by Madame Lachapelle and Madame Legrand, and its use made public both in his lectures and in several pharmaceutical works. As the introduction of belladonna into obstetric practice has been arrogated by more than one accoucheur of this metropolis, we think it just to assign the practice to the real originator of it.—*Lond. Med. Repository, March,* 1824.

Species of Extra-Uterine Fœtation observed by M. Breschet.—This surgeon has lately seen a case in which the fœtus appeared to have been developed in the parietes of the womb itself. This could only have arisen from the ovum having been detained in that part of the tube terminating in the parietes of the womb, or from having escaped from the former, by means of some small diverticulum, into the latter—and, therefore, it can only be considered an instance of a rare variety of tubal fœtation.—*Rév. Méd. Dec.* 1823.

Inversion of the Uterus.—Dr. Teallier relates the following case. Madame R—, twenty-four years of age, well formed, became pregnant five years after her marriage—she experienced great chagrin during the course of her pregnancy, but completed her full period of gestation without any accident. On the 2d of September, 1823, Madame R— was delivered safely, after a labour which lasted thirty-six hours—the placenta was extracted shortly afterwards without difficulty, and the patient was put to bed cautiously, and expressing herself comfortable. The patient felt pain and tension in the abdomen—the bowels were costive, and the urine was scanty, and produced pain in voiding it. By the 7th of the month all these symptoms were removed, and every thing went on satisfactorily until the 12th, when Dr. T. was called at one o'clock in the morning to Madame R—, who, in making violent efforts to evacuate the contents of the rectum, had felt a bulky mass of flesh descend through the vagina, which, though it did not produce much pain at the time, in about an hour after was followed by great pain in the belly and displaced parts, and in the groins, with strong efforts to vomit, and a sensation of faintness. She was much alarmed, and retired to bed where she was lying, supporting between her thighs a smooth tumour, of a deep red colour, of the size and shape of a large pear—its large extremity was resting on the thighs, its pedicle was tied within the labia. There was no doubt of the nature of the case, and Dr. T. proceeded to the reduction, first, by placing the patient in a proper posture, and then returning the tumour, with his right hand well oiled, into the vagina—but, in endeavouring to restore it to its natural situation, the hardness and contraction of the neck rendered it impossible, the sensibility of the organ being so much augmented that the least pressure produced violent pain. Dr. T. therefore suspended his attempts, determined to renew them when circumstances were more favourable. The patient was placed upon her back, the pelvis elevated, the thighs closed, and emollient fomentations and injections were employed—a rigid diet was observed for the first twenty-four hours. There was no hemorrhage, but little pain in the abdomen, or fever.

On the evening of the 13th, an obstinate cough, attended with fever and some pain in the abdomen, came on, but a large bleeding on the 14th removed these symptoms—and on the 18th the condition of the patient continuing to be satisfactory, Dr. T. finding the tumour to be softer and smaller, determined to make another attempt at reducing it to its natural situation, and which he succeeded in effecting in one hour and a half, making during that time a moderate and continued pressure with the hand. No symptoms of consequence ensued, that

could be ascribed to the accident—and, notwithstanding a slight attack of phlegmasia dolens, she recovered perfectly five weeks after her accouchment.—*Journal Universel, Novembre.*

THEORY AND PRACTICE OF MEDICINE AND MATERIA MEDICA.

On the Sublingual Pustules which supervene after the inoculation of the Rabid Virus. By M. Magistel.—M. Marochetti had stated the existence of pustules under the tongues of those who had been bitten by a rabid animal; and had attributed great advantages to the opening and subsequent cauterization of these pustules, along with the internal employment of the decoctum genistæ—a mode of treatment which M. Marochetti had seen successfully employed in the Ukraine. An event, which occurred on the 12th of October, 1822, at Boulay, enabled M. Magistel to inquire into the correctness of M. Marochetti's observations. Several individuals of both sexes, and some sheep, having been bitten by a rabid dog, M. Magistel was sent by the administrative authorities, and he cauterized the wounds forty-eight hours after the accident. This gentleman carefully watched for the appearance of the pustules, mentioned by M. Marochetti, and in several subjects confided to his care, he observed pustules arise, unknown to the patients, without any precursory symptoms, and without occasioning pain, or cramping the movements of the tongue. Some of these pustules appeared on the sixth day, others subsequently, and the last on the thirty-second day. M. Magistel distinguishes them into two species, which he denominates *crystalline* and *opaque*. The *crystalline* pustules are projecting, rounded, and of the size and form of hemp-seed; they are transparent, and contain a limpid and serous fluid. The *opaque* pustules are flattened, of a circular form, of the size of a lentil, and covered with a brownish pellicle, without transparency. The former seem situated at the superficies of the inferior surface of the tongue—the latter appear to penetrate into the substance of the organ, so as to present, when they are opened, a small ulcerated cavity.

Almost all these pustules are situated on the sides of the frænum linguæ, and on the lateral parts of the inferior surface of that organ; but a very small number are seen, on the edges and extremity of the tongue. M. Magistel has only observed one, on the dorsal surface, and the equivocal characters which it presented, induced him to consider it as not hydrophobic. He observed them also on the edges of a wound made on the lower lip of one of those who had been bitten.

M. Magistel asked, whether both these sorts of pustules are

of the same nature, and whether they are equally hydrophobic? The crystalline pustules appeared at a period when the hydrophobic symptoms had not manifested themselves in any of those who had been bitten, and they did not appear in all the individuals. The opaque showed themselves at a more advanced period; all the bitten, without exception, exhibiting them. The cauterization of both species was soon followed by their perfect cicatrization, no traces remaining of them, and the cauterized parts being in the best possible condition.

The *decoctum genistæ* was perseveringly administered to all those who were bitten, and was used for washing the wounds—which, unfortunately, had not been cauterized until forty-eight hours after the accident, except incompletely, by the nitric acid, at the expiration of more than forty-five hours.

Of ten bitten, whom M. Magistel attended, many of whom had received numerous and deep wounds, five died with all the symptoms of the most confirmed hydrophobia, in spite of the uninterrupted use of the *decoctum genistæ*, and the cauterization of the sublingual pustules.

So far, therefore, as the cases of M. Magistel go, we fear that but little dependence can be placed on the observations of M. Marochetti—on so important a subject, however, the counter-statements of one individual are sufficient to overthrow the positive remarks of another.

M. Magistel states one fact in his *Memoire*, which is worthy of notice, inasmuch as it appears to be in opposition to the opinion generally received amongst veterinary surgeons, that ruminating animals, labouring under hydrophobia, do not bite. In this case several sheep were bitten by the same wolf, and became hydrophobic, when they evidently endeavoured to bite the other sheep with which they were shut up.—*Journal Général de Médecine, Septembre,* 1823.

On the Treatment of Poisoning with Opium by the Cold Affusion.—Mr. Jones has detailed* a case of poisoning by opium, wherein the cold affusion was employed successfully. Our readers will recollect that cases of the success of this practice were published in the number of the Repository for June, 1822, by Mr. Wray and ourselves. Of the benefit of the affusion, as pointed out in the detail of those cases, and in the remarks made upon them, there can be no doubt—and we are only surprised, notwithstanding the publicity given to this practice, that so many practitioners still remain ignorant of its great and decided utility.—*London Medical Repository, Jan.* 1824.

* Technical Repository, No. XXIII. pp. 326.

On the Red Disease (Mal Rouge) of Cayenne.—Dr. Bergeron, of the French navy, has lately published a description of this disease, which bears some analogy to elephantiasis. It attacks equally both sexes, most commonly blacks and mulatoes, those especially who live upon fish or unwholesome provisions, and very seldom affects the white inhabitants—it is endemic in that climate, and has its seat in the skin and cellular texture beneath it. This disease first shows itself by red patches, not circumscribed, having a great disposition to extend themselves—afterwards turning yellowish, and lessening the sensibility of the part in which they occur—in which respect it bears some resemblance to elephantiasis, lepra, and the Barbadoes disease.

The spots show themselves most commonly on the shoulders, forehead, nose, and ears, afterwards spreading to the back, thighs, and feet—that is, the parts most exposed to the action of the sun and the air suffering first. At this stage of the disease the health does not suffer, and it often remains for a long time stationary—at length, however, the lips, cheeks, forehead, and eyelids, swell, and become hard—the heat of the skin is augmented—the voice is hoarse, but the internal organs do not appear to suffer. The second stage of the malady commences with an eruption of hard and insensible tubercles, or sometimes small pustules—the skin becomes wrinkled and uneven, the breath is fetid, and the patient complains of lassitude. The third stage of the disease is marked by violent fever and thirst, loss of appetite, deep ulcerations and disorganization of the skin—the loss of the hair, nails, or even of the nose and ears—and affections of the digestive organs.

M. Bergeron endeavours to prove, notwithstanding some marks of similarity, that this disease is essentially different from the elephantiasis—and observes, that those organs that most commonly suffer in the one case, remain unaffected in the other: nevertheless, they seem to differ more in degree than in kind. Among the causes which the author assigns for the great frequency of this disease among the blacks, is the absorption of the solar rays, and their constant exposure to suppressed perspiration from the breezes of the country. When this complaint attacks in an acute form, its rapidity is frightful.

Our author does not say much as to the mode of treatment: he justly condemns the separation of these unfortunate beings from society, under the dread of contagion—they are generally, it seems, abandoned to themselves. M. Bergeron condemns the oxymuriate of mercury as an external application, but thinks its internal exhibition might answer better. He considers cauterization as the most appropriate remedy at the commencement, especially the employment of the nitrate of silver.—*Journal Universel des Sciences Medicales, Decembre,* 1823.

On Lupulin, as a Medicine. By NICHOLAS MILL, Esq.—Preparations of the hop have been occasionally used in medicine in this country. The whole of the plant has usually been employed to form a tincture, but from the extraneous matter introduced by this means, it has doubtless rendered this medicine inert, if not prejudicial. Dr. Ives discovered that the true aromatic bitter of the hop resided solely in a pulverulent matter, which he called lupulin, for the collection, preparation, and administration of which, I am about to give specific directions.

Take any quantity of the best hops, and rub them strongly between the hands, or put them in a bag, and beat them for some time—when the beating is completed, throw them on a coarse wire seive, which will only suffer the dust, &c. to pass it—let them be well rubbed on the seive till every thing has gone through, except the leaves and stems of the plant—reject the leaves and stems altogether, and sift what has already passed the wire through a lawn sieve—nothing will now pass but a very fine powder resembling red sand—this is the lupulin, in which the whole virtue of the hop resides.

The preparations of this substance which I have found to be most efficacious are the decoction and tincture.

The decoction may be made by putting a sufficient quantity of lupulin into a Florence flask, in a sand heat, and filling it three parts full with distilled water, boil the whole for half an hour, and strain through cotton cloth. The solution thus obtained will be feculent, and does not become clear by repose—therefore add, while hot, a small quantity of sulution of gelatine in hot water—shake the whole together, and let it remain till cold, then filter through paper, and a clear yellow liquid will be obtained. It is intensely, but not unpleasantly bitter—and when administered in doses of a tea-spoonful at a time, in a table-spoonful of cold water, is a true stomachic. It is tonic, narcotic, and aromatic. It does not produce constipation of the bowels, as almost all other tonics do. It appears to act entirely on the nervous system, and may be prescribed with manifest advantage in all cases of debility and in action of the digestive organs where powerful tonics would be injurious.

The tincture may be prepared by digesting the lupulin on *strong and warm alcohol*, till saturated—when it must be filtered through paper, and a deep red solution will be obtained.

From forty to sixty minims of this tincture act as an anodyne, and have a powerful effect in allaying great nervous irritation; and that stupidity which often accompanies the use of opium, is never induced by this medicine.—*Annals of Philosophy.*

Inoculation with Syphilitic Matter.—Three students of medicine in Paris, having adopted the theoretical opinion that the

existence of any specific virus was but an antiquated and absurd doctrine, lately resolved to illustrate the new discovery on their own persons. They inoculated themselves with matter from venereal sores, by means of punctures in the arm with a lancet, resembling those usually practised in vaccinating. In one instance, the operation was followed by enlargement of the glands of the axilla, and was treated by simple antiphlogistic means, agreeably to the opinion already mentioned of its nature. Nevertheless, the swelling continued to increase—ran on to suppuration, destroyed a considerable portion of the axilla—and is not yet healed.

In a second, the puncture became inflamed and ulcerated—a chancre formed, which had all the characters of a true venereal sore, [query, what may these be?] and was treated as in the preceding case, by antiphlogistics. The ulceration continued to spread in an alarming manner, until at length the young man was induced to consult an eminent practitioner, who informed him that the sore was syphilitic, and absolutely required the use of mercury. The unfortunate subject of this experiment put a period to his existence by opening the crural artery.

We copy this case, not because we agree with the writer in regarding it as calculated to throw any additional light on the nature of syphilis, but that it may serve as a caution to other students who may be ambitious of distinguishing themselves by the performance of similar experiments on their own persons, without having strength of mind to bear their loathsome and disgusting results.—*Gazette de Santé, Decembre.*

Hydrophobia, and Injection of Warm Water into the Veins.—Our readers may recollect hearing of this experiment, performed by M. Magendie on a baker, who was brought into the Hotel Dieu, labouring, as it was supposed, under symptoms of hydrophobia, and who had moreover a wound on the hand. M. Magendie, in spite of the terrible convulsions with which the man was affected, threw about a pint of warm water into the veins of the patient's arm, and in half an hour the relief obtained was very considerable—inasmuch as he could drink, the convulsions had ceased, and he had no longer any disposition to bite—however, he died on the sixth day—and we only mention the case here because it appears that the man had never *been bitten at all*, and that the wound of the hand was produced by his having fallen upon a broken cup.—*Revue Medicale, Novembre.*

Tincture of Nicotiana in Ischuria.—Dr. Westburg, of Halmstad, in Sweden, has derived great advantage from the use of

tincture of nicotiana in the treatment of ischuria: he gives twenty drops every hour, in a glass of linseed tea, and he has universally observed the most beneficial results, sometimes even from the second or third dose. He also employs this remedy successfully in blenorrhœa, when the patient can only make water drop by drop.—*Ib.*

Degeneration of Muscles from long Inaction.—M. Guersent lately presented, to the Royal Academy of Medicine of Paris, an example of that degeneration which has been called *fatty*, of the muscles of the breech. A child was affected for three years with a complete contraction of the right lower extremity, the leg being permanently bent on the thigh, and the thigh on the pelvis. He died of the croup. The spinal marrow was healthy, as well as the nerves arising from it. The great gluteus muscle, deprived of its natural red colour, presented the appearance of yellow wax; but the form and direction of the fibre were easily recognised, and the tissue of which these were composed could not be confounded with that of the adipose substance between them. The muscle, then, was not converted into fat, but only the fibrin constituting the basis of the muscular tissue was entirely deprived of colouring matter.—This case is in unison with the observations of M. Beclard, who thinks that this kind of transformation in muscles consists solely in their being deprived of colour and becoming extenuated, while fat occurs in the interstices between the fibres. In the same individual, the gastronemius muscle of the contracted side was remarkable for its great development, although it was extremely pale.—*Ib.*

On the Use of Injections of Tepid Water into the Bladder in Catarrhus Vesicæ.—M. Jules Cloquet lately treated, at the Hospital of St. Louis, a case of very severe catarrhus vesicæ, by means of "irrigations" of tepid water introduced into the bladder. The disease had previously resisted various methods of treatment, and remained perfectly cured at the time this account is dated, eighteen months after his discharge from the hospital. M. Cloquet mentions, however, that he has not always obtained such satisfactory results, many experiencing only an inconsiderable relief from this method of treatment, but that in no case was the disease aggravated.—*Ib.*

Substitute for Prussic Acid.—There are few medicines concerning which more contradictory accounts have been published, than those respecting the prussic acid. This is, no doubt, to be attributed in part to the extreme volatility of its nature,

and the facility with which it undergoes decomposition, by which means it is difficult to procure it of uniform strength, or to ascertain that it is exhibited in a satisfactory condition. With a view of obviating this evil, and procuring a preparation of a less evanescent kind, MM. Robiquet and Villermé have performed a variety of experiments; the results of which have led them to propose the hydro-cyanate of potass, or the cyanuret of potassium, as a substitute in practice for the simple hydro-cyanic acid. The fact of its less easy decomposition, on dilution with water and exposure to light, seems to have been satisfactorily shown; but the question whether the action of this powerful medicine upon the animal frame, when combined with an alkali, be identical with that of the pure acid, or so similar as to render it admissible as a substitute, remains to be ascertained by future observation. That this substance exerts a powerful and deleterious influence, producing death in a manner analogous to the prussic acid itself, was ascertained by the sacrifice of a number of dogs, guinea pigs, birds, &c. which were speedily killed by it; and the general conclusions of MM. Robiquet and Villermé are as follows:

"1st. That the effects of the pure hydro-cyanate of potass, as manifested in our experiments, are similar to those of the hydro-cyanic or prussic acid.

"2d. That the employment of the hydro-cyanate of potass, prepared extemporaneously by the solution of the cyanuret of potassium, appears capable of being substituted with advantage for the hydro-cyanic acid, such as has generally been used up to the present time; and that this deserves attention.

"3d. That it would be necessary to ascertain whether the new medicine which we propose may not produce, upon the animal economy, other effects than the prussic acid.

"4. And that, in case of its producing others, these would require to be accurately inquired into, to ascertain whether they be hurtful or otherwise.—*Journal de Physiologie.*

Remarkable Case of Imperforate Anus and Urethra.—M. Murat recently communicated to the "Académie Royale de Médecine," an account, by M. Denis, of a mendicant, upwards of seventy years of age, living in a village near Nancy, who has been paraplegic since his infancy. His lower extremities are in a state of complete atrophy. The anus and the urethra are imperforate; and he returns, by vomiting, the excrementitial parts of his aliments.—***Rév. Méd. Dec.*** 1823.

On the Transmission of Contagious Principles, from the Lower Animals to the Human Species. By Professor Remer, of Breslau.—One great question in pathology is to ascertain if

hydrophobia and vaccinia are the only maladies which may be transmitted from the lower animals to man: or if a similar transmission may likewise take place in other diseases to which animals are subject—and in the latter case, what are these diseases? In order to solve this question, M. Remer adduces a number of facts, which prove, in a very conclusive manner, that certain other disorders, such as the virulent coryza of horses, the plica of animals covered with hair, the gangrenous inflammation of the spleen, which occurs in cows, &c. may, from immediate contact, be transmitted from the animal to the human species, and there give rise to diseases entirely resembling those which gave them origin.—*Archives Génér. Sept.* 1823.

On the Direct Passage of Substances into the Blood.—Although the frequently repeated experiments of Flandrin, Magendie, Mayer, Gmelin and Tiedemann, leave little doubt as to the direct passage of many substances into the venous system, it gives us additional pleasure to notice a further confirmation of them by a skilful physiologist, M. Westrumb of Hamelin. His experiments are the following. The sulphuretted hydrocyanate of potass, indigo, rhubarb, oil of turpentine, were injected into the stomachs of dogs and sheep: and after various intervals of time, the animals were killed and carefully examined. When a mixture of indigo and oil of turpentine had been used, and the animal was killed five hours after the beginning of the experiment, the two substances were plainly manifested to the sight and smell in the whole tract of the intestines, as well as in the blood of the vena portæ, in the substances of the lungs, liver and kidney, and in the urine—but not a vestige could be recognised in the glands of the mesentery, or in the chyle. The oil of turpentine and the hydrocyanate of potass were given to a sheep in repeated doses during four days, and it was killed half an hour after the last dose. Neither of these easily detected substances could be found in the lymphatic vessels or glands of the mesentery, or in the thoracic duct—but both of them were very obvious in the liver, kidney, spleen, and blood of the vena portæ. Similar results were obtained with the decoction of rhubarb, and the sulphuretted hydrocyanate of potass. Tying the thoracic duct near its termination did not alter the phenomena. The researches of Westrumb likewise confirm those of former experimenters as to the extreme rapidity of the venous absorption. He detected rhubarb in his own urine five minutes after swallowing an ounce of its infusion; and after the same period in rabbits, but not earlier. Half a grain of the hydrocyanate of potass given to a little dog, became sensible in the urine *at the end of two minutes.*—*Journal Complementaire, &c. Sept.* 1823, xvi. 235.

A new Remedy for excessive Salivation.—Dr. Kruger-Hansen, of Gostrow, has given an account of a man who, during a state of excessive salivation, attended with hemorrhage from the gums, had employed the usual astringent gargles without benefit, who afterwards covered his tongue and inside of his mouth and fauces with tar, by means of a brush. He soon afterwards recovered, without any other remedy. Dr. K. has since employed the same means in several cases, with the effect of quickly removing this disagreeable consequence of medical treatment, without any inconvenience resulting from this new method.—*Rev. Med. Juillet*, 1823.

Chlorine, with Water, employed in the Treatment of Scarlatina.—Dr. Braun, who details the advantages of this remedy, carries his enthusiasm so far as to call it a specific in scarlet fever. During ten years he has employed it successfully in the most complicated cases. Chlorine mixed with water, he says, destroys contagion—and the cure is seldom followed by any consecutive disease. He gives this medicine in the dose of a tea-spoonful every two or three hours, to children from three to six years of age, and to those of a more advanced age, a table-spoonful in the same intervals. It is given without the addition of any other medium, as the chlorine is decomposed in most mixtures. It should be swallowed quickly, lest it should produce cough. M. Braun observes that in the sore throat which often accompanies the scarlet fever, this water is more easily swallowed even than mucilaginous drinks. As soon as the disease begins to decline, he only prescribes the medicine in the dose of one or two spoonsful in the day. The whole quantity taken during the disease has never exceeded two ounces in the cases of children, and four or five ounces in those of adults. If this medicine is given in greater doses it brings on vomiting and frequent alvine evacuations—if it is not fresh, or has been exposed to the atmospheric air, it produces slight excoriations of the lips. M. Hufeland had already recommended this remedy in nervous and typhus fevers.—*Revue Medicale, Juillet*.

CHEMISTRY.

Efficacy of the Chloruret of Lime as a disinfecting Agent.—Messrs. Orfila, Lesueur, Gerdy, and Hennell, having been requested by the *Procureur du Roi* to examine the body of an individual who was supposed to have been poisoned, and who had been dead for nearly a month, found the smell so insupportable that they were induced to try the application of chloruret of lime, as recommended by M. Labarraque in the pamphlet to

which we had occasion to refer in our last number. A solution of this substance was frequently sprinkled over the body, and produced quite a marvellous effect—for scarcely had they made a few aspersions, when the unpleasant odour was instantly destroyed, and the operation could be proceeded in with comparative comfort.—*Archives Générales de Médecine, Août,* 1823.

On the Absence of Carbonic Acid in the Atmosphere over the Sea.—M. Vogel found that atmospheric air taken over the sea, half a mile from the sea-shore of Doberan, contained so little carbonic acid, that a solution of pure barytes was hardly made turbid by it—while the same bulk of air taken on shore produced a considerable quantity of carbonate of barytes. M. Vogel repeated these experiments in 1822, in the channel, two leagues from Dieppe, and on shore, with the same results. M. V. adds, this may be easily conceived, as the animal substances, although they easily putrify and form carbonic acid, cannot communicate it to the air, because the sea-water absorbs it.—*Ann de Chimie.*

AMERICAN INTELLIGENCE.

TO THE MANAGERS OF THE PHILADELPHIA ALMS HOUSE.

Report of the number, nature, and termination of Cases received at the Small-Pox Hospital, from the time of its being first opened, to the present date. By John K. Mitchell, M. D. and John Bell, M. D.

The gradual diminution of the small-pox, and the comparative emptiness of the wards of the temporary hospital set apart for the reception of those labouring under the disease, induce a hope of its extinguishment, and are circumstances which would seem to warrant, if not require the following report, a summary of regular records kept by the undersigned.

Numerous as have been the victims of this dread malady, a consoling reflection still remains, that the proportionate mortality is not so great as has occasionally occurred in other places during the epidemical visitations of this pestilence;* and what is of paramount importance, is much less than it would have been but for the humane and timely interference of the Managers of the Alms House. Their prompt selection at first of a building in the city, and subsequently of the Bush Hill

* "Of thirty-seven ill of the worst kind of small-pox, attended by Baron Dimsdale, in Russia, thirty-five died."—*Wilson on Febrile Diseases.*

Hospital, together with a liberal allowance of all that could minister to the comfort and relief of the unfortunate sufferers under the disease, added much to the efficiency of the medical department.

It will be remembered, that on the first separation of those labouring under small-pox from the other patients in the Alms House, Dr. Mitchell became the medical attendant, and continued in this capacity until the 1st of January, with the exception of a short interval of indisposition, when his place was supplied by Dr. Harris. From the beginning of the year down to the present time, Dr. Bell has been associated with Dr. Mitchell in the medical services to the hospital, and the following report is the result of their conjoined observations.

[Here follows a list of 161 patients.]

Under treatment in the building in the vicinity of the Alms House, three cases.

Of the one hundred and sixty-one cases here given, three were of measles, two of the subjects of which had been inoculated in early life. The nature and termination of the one hundred and fifty-eight cases of small-pox, in its natural and mitigated state, are as follows :

	Unprotected.	Vaccinated.	Inoculated.	Previous S. Pox.	Unknown.
	115	25	5	4	9
Deaths,	70		2	2	

In regard to colour, the proportion runs thus :

	Whites Total.	Whites Unprotected.	Blacks Total.	Blacks Unprotected.
	63	44	87	66
Deaths,		24		43

In reference to sex we find there were :

	Males.	Females.
	84	74
Deaths,	47	30

From these comparative estimates we see the great mortality among those seized with the natural small-pox, and the uniform recovery of those attacked with the mitigated form of the disease produced by previous vaccination. Though the cases are scarcely numerous enough to enable us to draw an inference beyond the reach of cavil, we are justified on a reference to the first of the above tables, in placing vaccination before inoculation, and even a previous attack of small-pox, as guarding most certainly against a fatal termination, though it may not guarantee so well as either of the two latter, exemption from the

secondary or mitigated form of the disease. We find by the second and third tables, that, of the whites unprotected, about one-half died, while of the blacks, in similar circumstances, two-thirds died. Of the males, the proportion of deaths in the unprotected, was nearly three-fifths—of the females two-fifths.

The anomalous varieties of the natural small-pox which proved most unmanageable by medical treatment, and fatal in their termination, were:—

1. Where the eruption was irregular in figure, flat or little elevated, dry and of a certain hardness—never fully maturing. After the fifth or sixth day, the face swelled and the skin was of a smooth and mottled appearance. With these symptoms were generally associated sore throat, salivation and delirium. We have met with no instance of recovery from this form of the disease, in which the muscular strength was often retained to the last hour. Death occurred from the eighth to the eleventh day.

2. Where the eruption was confluent, and the body covered with coherent clusters, the skin being of a rosy or deep red hue. Sore throat was often met with at the same time. On the filling of the pustules the secondary fever and delirium supervened, and frequently carried off the patient from the twelfth to the sixteenth day.

3. After the eruption was subsiding and desquamation commencing, erysipelas of the face and extremities supervened and terminated fatally. This may be considered as a hospital variety of the disease, for we have not seen it in the numerous subjects of dispensary or private practice.

In the latter stage of the disease, more especially when the eruption had been very extensive and full, the lining membrane of the stomach and lungs have taken on inflammation to such extent as to cause the patient's death. In other cases the skin denuded of its outer covering or cuticle, became exquisitely sensible to the slightest variations of temperature in the surrounding air, and the impression thus transmitted to the lungs already enfeebled by previous disease, has been followed by catarrh or pneumonia, which sometimes destroyed the patient in twenty-four or thirty hours.

As our attention is still directed to the subject, and we continue to observe studiously the cases which, though in smaller number, are still presented to our notice, we forbear on the present occasion entering into a minute history of the disease, or details of medical treatment.

Respectfully submitted by

J. K. MITCHELL,
JOHN BELL.

April, 5, 1824.

Return of Deaths in the City of Boston, from the 1st *of January,* 1823, *to the* 1st *of January,* 1824. *Specifying their Sexes, Ages and Diseases.*

Deaths in each Month.	Males.	Females.	Total.
January, . .	51	46	96
February, . .	35	43	78
March, . . .	53	44	97
April, . . .	46	42	88
May, . . .	57	39	96
June, . . .	39	33	72
July, . . .	37	30	67
August, . .	37	58	95
September, .	71	64	135
October, . .	68	75	143
November, .	45	57	102
December, .	45	39	84
Totals,	584	570	1154

AGES.	
Under 1 Year,	269
From 1 to 2	94
2 to 5	38
5 to 10	37
10 to 20	51
20 to 30	132
30 to 40	117
40 to 50	119
50 to 60	63
60 to 70	46
70 to 80	42
80 to 90	22
90 to 100	3
Ages unknown,	120
Total,	1154

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Abscess, ...	4
Accident, . . .	16
Angina Pectoris, . .	1
Aneurism, . . .	1
Apoplexy, . . .	11
Asthma, ...	1
Atrophy, . . .	1
Burns, ...	2
Carbuncle, . . .	1
Cholera Infantum, . .	13
Cancer, ...	3
Casualties, . . .	4
Cholera Morbus, . .	2
Cholic, Bilious, . .	1
Consumption, . .	183
Croup, ...	13
Cynanche Trachealis, .	1
Debility, . . .	6
Diarrhœa, . . .	12
Diseases unknown, .	212
Carried up, . .	488

Brought up, . .	488
Diseases of the Heart, .	7
Delirium Tremens, .	7
Dyspepsia, . . .	3
Dropsy, ...	18
Drowned, . . .	16
Dysentery, . . .	25
Effusion of the Brain, .	2
Epilepsy, . . .	1
Fever, Inflammatory, .	12
Pulmonic, . .	38
Pleurisy, . .	4
Typhus, . . .	27
Nervous, . .	3
Rheumatic, . .	1
Puerperal, . .	5
Intermittent, .	1
Fits, ...	9
Fracture, . . .	2
Gout, ...	2
Carried over, . .	671

Brought over,	671	Brought up,	1010
Gravel,	2	Rheumatism,	1
Hooping-cough,	17	Syphilis,	1
Hernia, Strangulated,	2	Scrofula,	4
Hydrocephalus,	9	Scalded,	1
Hydrothorax,	5	Scirrhous Liver,	6
Infantile Diseases,	198	Sphacelus,	1
Inflammation of the Brain,	16	Spasms,	3
Inflammation of the Bowels,	15	Still Born,	95
Intemperance,	10	Sudden Death,	5
Jaundice,	3	Suicide,	3
Marasmus,	7	Stricture Urethra,	3
Mortification,	4	Teething,	2
Old Age,	39	White Swelling,	1
Organic Disease, Brain,	1	Worms,	3
Palsy,	5	Wounds,	4
Phthisic,	1	Yellow Fever,	1
Quinsy,	5	Total,	1154
Carried up,	1010		

The number of inhabitants in the city of Boston, by the late census, were 43,893. Boston lies in 42° 23′ 15″ north latitude, and 70° 32′ 42″ west longitude.

By order of the Commissioners of Health,

JOHN WINSLOW, Secretary.

Statement of Deaths in the City and County of New York, from the 1st of January, 1823, to the 1st of January, 1824. Specifying their Sexes, Ages and Diseases.

Deaths in each Month.	Adults.	Children.	Total.
January,	153	84	237
February,	122	102	224
March,	131	120	251
April,	146	107	253
May,	143	92	235
June,	105	100	205
July,	139	243	382
August,	181	264	445
September,	173	188	361
October,	157	173	330
November,	134	112	246
December,	157	118	275
Totals,	1741	1703	3444

AGES.	
Under 1 Year,	879
From 1 to 2	315
2 to 5	230
5 to 10	117
10 to 20	153
20 to 30	453
30 to 40	411
40 to 50	345
50 to 60	232
60 to 70	135
70 to 80	109
80 to 90	49
90 to 100	14
100 to 110	2
Total,	3444

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Abscess,	10
Apoplexy,	58
Asthma,	6
Burned, or Scalded,	23
Carbuncle,	1
Cancer,	12
Casualties,	36
Catarrh,	2
Child-bed,	18
Cholera Morbus,	27
Cholic,	4
Compression of the Brain,	1
Consumption,	683
Convulsions,	202
Contusion,	3
Cramp in the Stomach,	8
Diabetes,	2
Diarrhœa,	64
Dropsy,	114
in the Chest,	33
in the Head,	144
Drowned,	53
Dysentery,	98
Dyspepsia,	6
Epilepsy,	4
Erysipelas,	11
Fever,	30
Bilious,	15
Bilious Maligna,	1
Bilious Remittent,	8
Inflammatory,	2
Intermittent,	14
Malignant,	1
Puerperal,	3
Remittent,	26
Scarlet	2
Typhus,	89
Yellow,	1
Flux, Infantile,	150
Fracture,	3
Gout,	1
Gravel,	4
Hemorrhage,	9
Carried up,	1982

Brought up,	1982
Hœmoptysis,	4
Hives, or Croup,	94
Hysteria,	1
Jaundice,	14
Infanticide,	1
Inflammation of the Bladder,	3
of the Bowels,	80
of the Brain,	47
of the Chest,	122
of the Liver,	31
of the Stomach,	8
Insanity,	4
Intemperance,	43
Killed or Murdered,	3
Locked Jaw,	8
Lumbar Abscess,	2
Marasmus,	25
Measles,	117
Menorrhagia,	1
Mortification,	10
Nervous disease,	7
Old Age,	134
Palsy,	31
Peripneumony,	30
Pleurisy,	22
Pneumonia Typhodes,	7
Quinsy,	8
Rheumatism,	6
Rickets,	1
Rupture,	3
St. Anthony's Fire,	2
Scirrhus of the Liver,	3
Scrofula, or King's Evil,	15
Scurvy,	1
Small Pox, *natural*,	18
Sore Throat,	10
Spasms,	7
Sprue,	21
Still Born,	223
Stone,	1
Sudden Death,	4
Carried over,	3154

Brought over,	3154	Brought up,	3308
Suicide, ...	18	Ulcers, ...	12
Syphilis, . . .	5	Unknown Diseases, .	74
Tabes Mesenterica, .	93	Whooping Cough, . .	31
Teething, . . .	37	Worms, ...	19
Vomica, ...	1		
		Total,	3444
Carried up,	3308		

Of the above mentioned Deaths, there were—

Men,	1007	
Boys,	955	
Total Males,		1962
Women,	734	
Girls,	748	
Total Females,		1482
Total Number,		3444

REMARKS.

The City Inspector respectfully reports to the Board, a Statement of the Deaths in the City and County of New York, for the year 1823, amounting to *three thousand four hundred and forty-four.* This number exceeds that of the preceding year, but is less than that of the year 1821.

The deaths by Consumption were *six hundred and eighty-three.* The males exceed the females *thirty-nine* in number.

The coloured persons that died of this fatal disease, were *seventy-six.* The total of this class of every complaint was *four hundred and thirty-two,* being about an eighth of the entire deaths of the city.

The *Yellow Fever* menaced our city during the summer months, but owing to the vigilance of our public authorities, under the protection of Providence, its progress was soon arrested—one fatal case only was reported as such, which was brought here from the Havana, by the ship Diana. The fever cases, in general, that terminated fatally, were much fewer than those of the preceding year.

Our infantile diseases that were fatal, were few, with the exception of measles, which prevailed in every part of our city—*one hundred and seventeen* having died of that complaint, whilst only *one* fell a victim to this disease the year preceding.

It is to be regretted that the *Small Pox, or a disease very analogous to it,* has made its appearance in our city, and still continues; *eighteen persons* died of this complaint in November and December. Its return, after its having disappeared in this

city, since July, 1818, should urge, with increased energy, the practice of vaccination, which unquestionably has been very beneficial to mankind, and seems, in the present instance, to have mitigated this destructive complaint, as fewer persons die of it, in the same proportion, than formerly did, before the introduction of that valuable discovery.

Respectfully submitted.

GEORGE CUMING, *City Inspector.*

City Inspector's Office, 19*th January,* 1824.

Statement of Deaths in the City and Liberties of Philadelphia, from the 1*st of January,* 1823, *to the* 1*st of January,* 1824. *Specifying their Sexes, Ages and Diseases.*

Deaths in each Month.	Adults.	Children.	Total.
January,	186	128	314
February,	158	96	254
March,	122	85	207
April,	177	113	290
May,	116	94	210
June,	160	210	370
July,	183	303	486
August,	205	290	495
September,	279	272	551
October,	235	222	457
November,	240	205	445
December,	305	216	521
Totals,	2366	2234	4600

AGES.		
Under	1 Year,	1082
From	1 to 2	401
	2 to 5	399
	5 to 10	184
	10 to 15	81
	15 to 20	151
	20 to 30	537
	30 to 40	536
	40 to 50	462
	50 to 60	312
	60 to 70	214
	70 to 80	137
	80 to 90	76
	90 to 100	24
	100 to 110	3
	110 to 120	1
	Total,	4600

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Aphtha,	2
Angina Pectoris,	5
Maligna,	1
Atrophy,	27
Apoplexy,	54
Abscess,	17
Carried up,	106

Brought up,	106
Asthma,	7
Aneurism,	2
Burns,	16
Bronchitis,	2
Consumption,	536
Carried over,	669

Brought over,	669	Brought up,	2428
Convulsions,	214	Fever, Bilious,	115
Cancer,	19	Typhus,	234
Cholic,	7	Remittent,	138
Cholera,	265	Intermittent,	60
Catarrh,	26	Nervous,	9
Contusion,	6	Hectic,	3
Casualties,	17	Scarlet,	11
Caries,	3	Puerperal,	23
Compression of the Brain,	1	Fracture,	10
Concussion of Do.	1	Fungus Hœmatodes,	1
Constipation of the Bowels,	1	Found Dead,	24
Congestion,	6	Gout,	3
Cynanche,	1	Gangrene and Mortification,	45
Cachexy,	1	Hanged,	1
Coma,	1	Hydrophobia,	1
Child-bed,	8	Hernia,	2
Cephalalgia,	1	Hives, or Croup,	67
Debility,	282	Hooping-Cough,	79
Decay,	17	Hæmorrhage,	25
Dropsy,	81	Insanity,	17
in the Head,	147	Inflammation of the lungs,	108
of the Breast,	47	Bowels,	71
Diarrhœa,	110	Liver,	37
Dysentery,	187	Brain,	46
Dyspepsia,	7	Stomach,	21
Drunkenness,	34	Breast,	21
Drowned,	40	Bladder,	3
Death by the Cold,	2	Kidneys,	2
by Violence,	1	Peritonæum,	14
by Laudanum,	3	Pericardium,	1
Drinking Cold Water,	2	Spleen,	2
Diabetes,	1	Uterus,	1
Disease of the Hip Joint,	1	Jaundice,	5
Disease of the Liver,	1	Locked Jaw,	14
Disease of the Heart,	4	Lethargy,	1
Disease of the Prostrate Gland,	2	Measles,	156
Effusion of the Brain,	2	Mania-a-Potu,	31
of the Lungs,	1	Old Age,	74
Epilepsy,	14	Palsy,	39
Eruptions,	6	Pleurisy,	13
Erysipelas,	24	Prolapsus Ani,	1
Fever,	165	Poisoned,	1
		Rheumatism,	5
Carried up,	2428	Carried over,	3962

Brought over,	3962	Brought up,	4085
Scirrhous Uterus,	2	Scrofula,	11
Suffocation,	1	Small-Pox, Natural,	160
Spina Bifida,	6	Still-Born,	228
Suicide,	6	Thrush,	2
Spasms,	5	Tumours,	4
Stone,	1	Teething,	10
Stricture,	1	Ulcers,	5
Syphilis,	6	Worms,	14
Sudden,	60	Wounds,	2
Sore Throat,	35	Unknown Diseases,	79
Carried up,	4085	Total,	4600

Of the above mentioned Deaths, there were—

Males of 20 years and upwards,	1329	
Ditto under 20 years,	1110	
		2439
Females of 20 years and upwards,	1031	
Ditto under 20 years,	1032	
		2063
Children, principally under one year, whose sex is unknown,		98
Total,		4600

Of the foregoing deaths, 641 died in the Alms House, and 800 were people of colour.

Agreeably to the Returns received at the Health Office from *one hundred and eleven* Practitioners of Midwifery, there were born in the City and Liberties of Philadelphia, from the 1st of January, to the 31st of December, 1823, both days inclusive.

Male Children,	2977
Female Ditto,	2836
Making the total number of Births,	5813
The whole number of Deaths,	4600
Difference between the *Births* and *Deaths*,	1213

By order of the Board of Health,

JOSEPH PRYOR, *Clerk.*

Health Office, January 30, 1824.

The Inspectors of the Prison of the City and county of Philadelphia, present the following Tables for the information of the public. The number of persons committed to the County Prison, in Arch street, for the year 1823, was 3582—two-thirds of whom were as vagrants, disorderly persons and disturbers of the peace. To this cause is to be attributed the quantum of disease which prevailed in that Institution during the last year.

The Diseases and Deaths which occurred in each Month of the Year 1823, *in the Penitentiary, or Walnut-street Prison, were as follow:—*

Months.	Diseases.	Deaths.	Diseases.	Deaths.
January,	22	2	Asthma,	1.
February,	21	2	Bleeding at Nose,	2
March,	33	2	Consumption,	7
April,	35	2	Debility,	1
May,	27	1	Diarrhœa,	1
June,	47	2	Dropsy,	1
July,	65	0	Fever, Bilious,	1
August,	44	0	Remittent,	3
September,	39	4	Typhus,	1
October,	21	0	Inflammation of the Breast,	2
November,	14	1		
December,	46	5	Small-pox,	1
Totals,	414	21	Total,	21

Of whom there were—

	Diseases.	Deaths.
Males,	382	18
Females,	32	3
Totals,	414	21

The Diseases and Deaths which occurred in each Month of the Year 1823, *in the County Prison of the City and County of Philadelphia, in Arch street, were as follow:—*

Months.	Diseases.	Deaths.	Diseases.	Deaths.
			Consumption,	3
January,	51	5	Debility,	4
February,	52	8	Diarrhœa,	1
March,	70	10	Dysentery,	2
April,	36	6	Fever,	5
May,	58	2	Inflammatory,	2
June,	52	1	Intermittent,	2
July,	36	2	Remittent,	12
August,	53	4	Typhus,	10
Carried over,	408	38	Carried over,	41

Brought over,	408	38
September,	61	11
October,	38	2
November,	38	3
December,	59	9
Totals,	604	63

Brought over,	41
Inflammation of the Lungs,	12
Intoxication,	2
Jaundice,	1
Mania-a-potu,	1
Pleurisy,	1
Small-pox,	5
Total,	63

Of whom there were—

	Diseases.	Deaths.
Males,	452	53
Females,	152	10
Totals,	604	63

Statement of Deaths in the City of Baltimore, from the 1st of January, 1823, to the 1st of January, 1824. Specifying their Sexes, Ages and Diseases.

Deaths in each Month.	Males.	Females.	Total.
January,	58	38	96
February,	73	48	121
March,	85	64	149
April,	95	65	160
May,	48	65	113
June,	131	101	232
July,	131	122	253
August,	149	121	270
September,	135	140	275
October,	87	84	171
November,	62	67	129
December,	77	62	139
Totals,	1131	977	2108

AGES.

Under 1 Year,	474
From 1 to 2	200
2 to 5	253
5 to 10	116
10 to 20	149
20 to 30	174
30 to 40	236
40 to 50	206
50 to 60	131
60 to 70	82
70 to 80	52
80 to 90	28
90 to 100	6
100 to 110	1
Total,	2108

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Ague, Dumb,	1
Apoplexy,	12
Asthma,	5
Burns,	5
Carried up,	23

Brought up,	23
Casualties,	23
Child-bed,	28
Cholera Infantum,	253
Carried over,	327

Brought over,	327	Brought up,	1269
Cholic,	2	Intemperance,	25
Cramp,	4	Jaundice,	1
Bilious,	3	Liver Complaint,	17
Consumption,	236	Locked Jaw,	1
Convulsions,	60	Mania,	1
Croup, or Hives,	52	Marasmus,	23
Debility,	1	Measles,	175
Decay,	56	Mortification,	15
Dropsy,	37	Murdered,	3
Drowned,	41	Old Age,	69
Dysentery,	46	Palsy,	11
Erysipelas,	2	Phthisic,	1
Exposure,	1	Pleurisy,	34
Fever, Bilious,	137	Poisoned,	1
Catarrhal,	18	Quinsy,	6
Inflammatory,	2	Rheumatism,	8
Intermittent,	5	Scrofula,	1
Nervous,	9	Scurvy,	1
Putrid,	1	Shot,	1
Remittent,	1	Small-Pox,	*2
Scarlet,	1	Still Born,	105
Typhus	148	Sudden,	19
Frost-bitten,	1	Suicide,	5
Gout,	1	Syphilis,	3
Gravel,	1	Teething,	13
Heeves,	1	Thrush,	6
Hemorrhage,	1	Tumour,	1
Hydrocephalus,	38	Typhoides Pneumonia,	31
Inflammation of the Brain,	15	Unknown Adults,	42
Breast,	5	Unknown Infants,	159
Bowels,	6	Visitation of God,	9
Lungs,	1	Voilence,	1
Throat,	4	Whooping Cough,	34
Insanity,	5	Worms,	15
Carried up,	1269	Total,	2108

Of the Deaths above enumerated, 650 were people of colour.

By order of the Board of Health,

EDWARD P. ROBERTS, *Secretary.*

BALTIMORE, January 1, 1824.

* These cases occurred in January, 1823.

Statement of Deaths in the City of Charleston, (South Carolina) from the 1st of January, 1823, to the 1st of January, 1824. Specifying their Sexes, Ages and Diseases.

Deaths in each Month.	Males.	Females.	Total.	AGES.	
January, . .	40	31	71	Under 3 Years,	217
February, . .	36	32	68	From 3 to 10	53
March, . .	24	21	45	10 to 20	50
April, . . .	38	33	71	20 to 30	101
May, . . .	42	34	76	30 to 40	111
June, . . .	63	47	110	40 to 50	94
July, . . .	43	44	87	50 to 60	61
August, . .	44	31	75	60 to 70	65
September, .	30	30	60	70 to 80	29
October, . .	30	27	57	80 to 90	27
November, .	27	27	54	90 to 100	5
December, .	15	25	40	100 to 110	1
Totals,	432	382	814	Total,	814

The above mentioned Deaths were caused by the following Diseases and Casualties, viz.

Abscess, . . .	6	Brought up, . .	453
Accident, . . .	15	Fever, Bilious, . .	26
Angina Pectoris, . .	2	Catarrhal, . .	22
Apoplexy, . . .	22	Country, . .	24
Asthma, . . .	3	Nervous, . .	28
Cancer, . . .	4	Remittent, . .	2
Catarrh, . . .	7	Worm, . .	25
Child-bed, . . .	7	Hooping-cough, . .	4
Cholera Morbus, . .	1	Inflammation of the Brain,	1
Cholic, ...	2	Lungs,	6
Consumption, . .	139	Imperforate Rectum, .	1
Convulsions, . .	50	Influenza, . . .	2
Cramp, . . .	6	Insanity, . . .	3
Croup, or Hives, . .	16	Intemperance, . .	14
Debility, . . .	35	Jaundice, . . .	4
Diarrhœa, . . .	52	Leprosy, . . .	1
Dropsy, . . .	71	Liver Complaint, . .	11
Drowned, . . .	6	Locked Jaw, . .	11
Dysentery, . . .	7	Mortification, . .	2
Dyspepsia, . . .	1	Old Age, . . .	55
Epilepsy, . . .	1	Palsy, ...	8
Carried up, . .	453	Carried over, .	703

Brought over,	703	Brought up,	751
Pleurisy,	7	Suicide,	6
Rheumatism,	8	Tænia,	1
Scrofula,	6	Teething,	42
Sore Leg,	2	Thrush,	10
Sore Throat,	15	Violence,	2
Spasms,	6	Wounds,	2
Sudden Death,	4		
		Total,	814
Carried up,	751		

Of the above mentioned Deaths, there were—

White Males,	217	
White Females,	132	
Total Whites,		349
Black Males,	215	
Black Females,	250	
Total Blacks,		465
Total Deaths,		814

By order of the Board of Health,

JAMES A. MILLER, *Clerk.*

UNIVERSITY OF PENNSYLVANIA.

At a public Commencement, held in the Hall of the University, on Thursday the 8th of April, 1824, the following gentlemen received the Degree of Doctor of Medicine:

NEW YORK.

Correll Humphrey, on Cynanche Trachealis.
Alexander Hosack, on Catarrhus Senilis.

NEW JERSEY.

Furman S. Cook, on Hepatitis.
Ephraim Lloyd, on Gonorrhœa.
William S. Bowen, on Hepatitis.
Jacob Hunt, on Cold Applications.
Hosea Fithian, on Dysentery.
William S. Hendrie, on Humid Tetter.
Anthony Keasbey, on Cantharides.
Samuel L. Howell, on Miasmata.
Charles Ridgway, on Fever.

PENNSYLVANIA.

William S. Wallace, on Remittent Fever.
James Webster, jr. on Medical Jurisprudence.
Wilson Jewell, on Nux Vomica.
Philip Peltz, jr. on Cholera Infantum.
Richard Gregg, on Intermittent Fever.
Chandler R. Gilman, on Hydrothorax.
William C. Brewster, on Mod. Ope. of Medicines.
J. C. B. Standbridge, on Fluor Albus.
Fisher Snow, on Intermittent Fever.
John P. Lewis, on Acute Hepatitis.
George N. Eckert, on Sal. Cynch. in Int. Fever.
Charles B. Jaudon, on Clinical Practice.
Lewis Horning, on Feb. Inf. Remittent.
Charles Henry Rohr, on Sal Cinchon.
William S. Helmuth, on Anasarca.
John Emerson, on Dysentery.
William A. Irvine, on Secale Cornutum.
Isaac Remington, on Inflammation.
Charles Wayne, on Bilious Fever.
Alexander Speer, on Fever of Adams County.
Caspar Wistar, on Intermittent Fever.
John Purves, on Hydrothorax.
John T. Huddleson, on Oleum Terebinthinæ.
Daniel C. Pfeiffer, on Enteritis.
Samuel Thompson, on Arum Triphyllum.
Erasmus Thomas, on Fractures of Os Femoris.
Daniel High, on Dysentery.
Robert Taylor, on Intermittent Fever.
John Banks, on Muriate of Gold.
George B. Taylor, on Apoplexy.
William Cox Poole, on Croup.
Richard Town, on Cynanche Trachealis.
James Porter, on Acute Hepatitis.

DELAWARE.

James Couper, jr. on De Morbis Oculorum.

MARYLAND.

Eldred M. Mobberly, on Hepatitis.
Levi Dent, on Tetanus.
Cuthbert S. Green, on Hydrocephalus Acutus.
John Chew Thomas, on Gastritis.
Greenberry Ridgley, jr. on Dysentery.

VIRGINIA.

Richard Kennon, on Pheumonia Typhoides.
Jonathan P. Gilliam, on Apoplexy.

John Fisher, on Leeches.
Philip G. Randolph, on Angina Pectoris.
John Patterson, on Remittent Fever.
Nimmo Morris, on Pleuritis.
Edwin A. Morrison, on Diseases of Liver.
George C. Scott, on Dysentery.
Alfred T. Magill, on Hæmoptysis.
Warner Briscoe, on Secale Cornutum.
James H. Gilliam, on Peritonitis.
James Tomkins, on Charcoal.
John R. Stone, on Pneumonia.
James L. Holladay, on Liriodendron Tulipifera.
Matthew Page, on Dysentery.
Alexander Jackson, on Cold in Fever.
Livingston Waddell, on Authority of Names.
Thomas W. Meriwether, on Hepatitis.
Alexander B. Cralle, on Gastritis.
Chastain Cocke, on Dysentery.
William D. Knox, on Gastritis.
David Hunter, on Mercury.
Robert A. Lacey, on Gonorrhœa.
George Williamson, on Cholera Morbus.
Caleb B. Matthews, on Ether Inhalation.
Edward Hatton, on Hepatitis.

NORTH CAROLINA.

Edmund C. F. Strudwick, on Stethoscope.
John Arrington, on Ascites.
John Haywood, on Typhus Fever.
James R. Glenn, on Trachitis.

SOUTH CAROLINA.

John I. Myers, on Cholera Morbus.
George W. Pressly, on Tela Aranea.
Joseph Warren, on Hydrophobia.
Elias Horlbeck, on Hepatic Phthisis.
Joseph S. Inglesby, on Pneumonia.
Roderick M. Taliaferro, on Bilious Fever.
Sam. Ben. Rush Finley, on Bilious Remittent.
Alexander M'Dowell, on Generation.
John T. Pratt, on Dysentery.

GEORGIA.

Philip Minis, on Yellow Fever.
Ransom Tuggle, on Scilla Maritima.
James B. Peterson, on Fluor Albus.
Joseph W. Grimes, on Malignant Fever.

William P. Hort, on Diabetes Mellitus.
James T. Hay, on Bilious Fever.

OHIO.

Squier Littell, on Inflammation.

W. E. HORNER, M. D. *Dean.*

Philadelphia Vaccine Institution.

The subscriber, who, for several years past, has been entrusted with the vaccination of the poor, under an Ordinance of the Select and Common Councils, and to whom numerous applications have consequently been made for furnishing vaccine matter, has heretofore gratuitously delivered it, at a considerable expense of time and labour, to practitioners of medicine in this as well as in other states of the Union. Under that Ordinance, it is his duty to supply the practitioners of the city—but in consequence of the increased demands from every section of the country, and with a view to accommodate with certainty the physicians of the United States, he has determined, by the advice of many of his medical friends, to open an Office for the distribution of genuine Vaccine Virus.

JOSEPH G. NANCREDE, M. D.
Vaccine Physician, under an Ordinance of the Select and Common Councils of the City of Philadelphia, No. 151, *South Tenth Street.*

We do entirely approve of the above plan for the distribution of vaccine matter, and do believe that the duties it enjoins will be performed by Dr. Nancrede with care and fidelity.

P. S. Physick, M. D.	*John Redman Coxe, M. D.*
N. Chapman, M. D.	*Joseph Hartshorne, M. D.*
Thomas C. James, M. D.	*John A. Monges, M. D.*
William Gibson, M. D.	*Thomas T. Hewson, M. D.*

N. B. Applications by letter, post paid, enclosing three dollars, will at all times receive immediate attention.

The Editors of Medical Journals throughout the Union are respectfully requested to give the above a few insertions in their respective works.

Philadelphia, May 1, 1824.

TO READERS AND CORRESPONDENTS.

1. We wish it to be distinctly understood, that we neither have, nor will receive, any pecuniary compensation as Editor of this Journal. The motives which led us to engage in the enterprize, are announced in our prospectus, and will be found liberal, and wholly disinterested. To this subject attention is now called, with a request, that communications for the work, and all matters of correspondence relative to it, may be addressed to the publishers, Messrs. H. C. Carey and I. Lea, Booksellers, Philadelphia.

2. To several correspondents our acknowledgments are due for communications for this Journal, which shall appear in our next number.

3. The Medical Lectures in the University of Pennsylvania, will commence on the first Monday in November next.

Anatomy, by Drs. Physick and Horner.

Materia Medica and Pharmacy, by Dr. Coxe.

Theory and Practice of Physic and Clinical Practice, by Dr. Chapman.

Midwifery, and the Diseases of Women and Children, by Dr. James.

Chemistry, by Dr. Hare.

Surgery, by Dr. Gibson.

*** The Clinical Lectures will be delivered in the Alms House Infirmary, twice a week, by Dr. Chapman and Dr. Gibson.

This extensive Institution, containing on an average not less than fifteen hundred patients, holds out the greatest advantages to the student of Practical Medicine and Surgery, as well as to the cultivators of Morbid Anatomy. To enable so large a class as usually attends, to derive the whole benefit of the clinical instructions, the students are seated in an amphitheatre, into which the patients, the subjects of remark, are in succession introduced, on a bed, from the adjacent *select wards*. The students in the interval of the lectures, have the privilege of visiting the wards, to examine the patients—to consult the record of the cases, and to transcribe any of the prescriptions which may be deemed valuable.

4. We are requested to invite the attention of our readers to the following advertisement.

University of Pennsylvania.

"The committee of the trustees appointed to distribute the tickets of gratuitous admission to the course of medical lectures which will begin in November next, agreeably to the foundation established by the Medical Faculty, give notice, that applications in writing, under seal, addressed for the above named committee, to the care of the secretary of the University of Pennsylvania, may be made at any time before the first Monday of September next. It is required, that each application be accompanied by a respectable testimonial of the good character of the applicant, and of his being in such restricted circumstances as entitle him to the benefit of this foundation. It must also appear, that he has attained the age of eighteen years, is possessed of sufficient literary acquirements, and of studious habits. On the first Monday of September next, the committee will open and decide on the applications, and return the others their applications and testimonials, their names not to be disclosed by the committee.

BENJAMIN CHEW,
WM. MEREDITH,
JAMES GIBSON,
Committee of the Trustees."

Philadelphia, July 29, 1824.

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THE

PHILADELPHIA JOURNAL

OF THE

MEDICAL AND PHYSICAL SCIENCES.

Art. I. *On the Minute Anatomy of the Bones.* Translated for this Journal, from the Latin of Antonio Scarpa, M. D. Professor of Anatomy in the University of Pavia,* by John D. Godman, M. D. Lecturer on Anatomy and Physiology.

ALTHOUGH the osseous system has for a long time been carefully studied, and is now thought to be absolutely known in every particular—though we have both learned and laboured treatises on the human bones, with most beautiful engravings, delineated as is said, "to the life"—and although there are many anatomical teachers, who (on account of the immense quantity of minutiæ gradually accumulated in the description of bones) hang over them during whole months—exhibit to their auditors all their inequalities, and pursue every depression and spiracle in each bone, to its termination—still, without sneering or arrogance, I think there is something that may be profitably added, concerning the peculiar anatomy of the bones.

* "De Penitiori Ossium Structura Commentarius."

Relinquishing and rejecting the hypotheses published by Gagliardi, concerning the *corrugated lamina*, and the quadruple order of hooks joining these lamina together, as well as what *Havers* has written relative to the spiracles conveying an oily fluid into the bones, we shall find that the more recent doctrines relative to the minute anatomy of bones, is neither more correct, nor more useful. They all say as with one voice, announcing it as a thing thoroughly investigated and clearly established, that the bones are composed of *fibres*, *layers* or *tables*, placed upon, or so connected and joined with each other, as to have their strata intermingled.* They say, moreover, that the fibres are stretched out in cylindrical bones according to their length, but in flat bones are disposed from the centre to the periphery—and lastly, that the strength of the bones depends on the size, number, and length of the layers. Those who attempt to support this doctrine, seem to have very slightly studied the nature and truth of the fact, when they produce calcined† bones, which split into leaves and tables, and add the testimony of surgeons who daily see caries removing layers and plates from the sound bone—thus yielding their belief to deceptive appearances, instead of making anatomical researches.

In fact, whoever should examine attentively, not only the more minute structure of the hardest parts of bones, which requires much care, and should cautiously inspect the external surface of young bones, will, I am convinced, from the first step, discover that the former doctrines have been too hastily advanced, and too rashly adopted. A careful observer would find, that the whole of what was called *fibre* in bone, is a mere mistake, and the short lines to which the name of *fibre* is rashly given, occupy a very small space,

* Reichel de ossium ortu, &c.

† In my experiments to test the accuracy of Scarpa's observations, I found that the *apparent* lamination of bone was never produced, except when the surface was suddenly and unequally heated. Bones calcined with a slow and steady fire, never gave me the least appearance of *tables*.
J. D. G.

and join at different angles with other very short tracts of the same kind, and by their successive apposition, easily impose on the careless observer, as if they were filaments continued throughout the substance of the bone. By the use of good microscopes, every one will readily perceive that these tracts are *branched**—unite with the nearest portions at angles of different degrees of acuteness, and being in a multiplex way interwoven, constitute a *reticular* structure, which may be plainly seen throughout the whole superficies of a bone, whether it be flat or cylindrical.

In relation to the layers and tables stratified in bones, every proper observer will understand and confess, that *calcination* is too rude a process, to allow anatomists to conclude thence, that bones naturally are formed of many strata, or by the coalescence of superimposed layers. Now although these are the hardest organs of animals, yet they are not throughout the whole of their peculiar structure of the same density, and held together at all points by an equally cohesive force: when acted on by heat, they must necessarily separate unequally and split in strata, although this is very far from being the natural structure of the bone. Nor because during life caries separates plates from bone, is it therefore fair for anatomists to assert, that the bones are naturally formed by superimposed tables—since sometimes the softest parts of the human body, and particularly the skin, is removed in gangrenous crusts and layers, from the supposed sound parts, while there is nothing better ascertained in the whole human structure, than that the substance and texture of the skin differs as much as possible from lamination.

Not only is the outer surface of the bone, which may be easily seen by any one, of this character, but I pronounce and affirm that even the greatest part of the whole osseous

* Malpighi formerly observed the same thing, *Anat. Plantar.* "These filaments are not all parallel to each other, and hence short appendices are given off, which being bound together, form a *net*, differing very little from the nature of *bark*, the area of which being larger, and the whole compages of fibres are filled and swelled by the exudation of an osseous juice."

system is *reticular* or *cellulous*. To demonstrate this I do not impose a very severe task on myself. It will be sufficient to show all the bones split, as Cheselden did, and I was accustomed to do during many years, before my class, while teaching anatomy. By this simple mode of treating the whole human skeleton, it is made evident at a glance to every one, the least versed in anatomy, that the greatest part of the bones are cellulous or reticular—a very small part remaining in these bones, which is hard, concrete, and stony, and like a bark externally covers and surrounds the cellulous or reticular structure. The quantity of the cortical in proportion to the spongy part of the broad bones, is very small in the scapulæ and ilia, and in the bodies of the vertebræ of the whole spine, where a large quantity of spongy substance is scarcely covered by a thin external bony crust. The lower jaw clavicle, and especially the sternum and ribs, are in great part spongy. The bones of the carpus, metacarpus, tarsus and metatarsus, and joints of the finger and toes, have a quantity of spongy, loose, and cellular texture, so far exceeding their external crust, that the bones of the hand and feet may without impropriety be termed *spongy*. In relation to the rest of the joints, it is very commonly known, that the middle of the cylindrical bones, as the arm and thigh bones, the radius, ulna, tibia and fibula, are very hard and firm—but as we gradually approach the extremities of these bones, their texture becomes looser, and they swell out in light and spongy protuberances covered by a thin external osseous sheet. Not only do we observe this in all the bones of the skeleton, but in the cartilages, as those of the ribs and of the larynx, which sometimes, though rarely, do ossify. When these are split through the middle, there will be perceived nearly the same proportion as in the true bones, between their external compact crust and their reticulated alveolar substance.

The whole controversy, therefore, relative to the minute anatomy of the bones, as far as I can judge, returns to this—not indeed whether the structure of the greatest part of

the bones is generally cellular or not, (as this is sufficiently proved by the sections made with the saw before mentioned,) but whether the hard and almost rocky walls of the bones, and their compact external crust no less than their internal substance, partake of this cellular texture. That I may answer this question as satisfactorily as possible, I have thought it best first to investigate the subject synthetically, and then analytically. Hence I have begun by examining the bones in the first rudiments of animation, that is when the cartilages begin to change to bone, and the first traces of the future bone appear at the same time. Then I deprived the hardest bones of an adult of their earthy particles, and reduced them to their original softness and pellucidness, thinking, as was proved by the experiment, that however entire the maturity of these bones might be, their minute structure would exhibit the same order and relation as was seen in the embryos. I therefore repeated Haller's experiments on the formation of bone in the incubated egg, the chief of which I subjoin entire, as they are recorded in my notes.

VIII Day from Incubation.

The femur and tibia were properly formed, but entirely cartilaginous, flexible, pellucid, in which no dissimilar point could be observed with the most powerful glasses. When dried they had the appearance of desiccated gum.

IX Day.

A yellowness begins to appear about the middle of the femur and tibia. The cartilage now begins to be somewhat *wrinkled* and *crisped*, but the rest is light and pellucid.

X Day.

The femur and tibia much more yellow and wrinkled in the middle than yesterday. *These wrinkles*, magnified by a good microscope, exhibited a very beautiful *network*, the lines mutually concurring at acute angles—yet this *network*

was still cartilaginous and flexible, differing in nothing from the rest of the cartilage of the future bone, except in opacity, yellowness, and a slight degree of roughness.

XI Day.

In the middle of the femur and tibia the roughness, or network, begins to harden. Being dried both sustain themselves by the middle, while the rest of the cartilage of the tibia and fibula collapses and appears like a gummy substance. The middle portion, which is not destroyed by drying, is a bony, rough, reticulated crust, which is only a little thicker in the middle than at the extremities. Moreover, near the lower part of the tibia and fibula, *red spots* begin to appear, which shew the situation of the inferior *nutritious artery*.

XII Day.

About the middle of the tibia, the *network*, or original ossification, is terminated by two red points, one above and the other below. The superior *nutritious* artery begins to be visible. The bone, when dried, preserves its cylindric form in the middle.

XIV Day.

The opake, reticular, and anteriorly osseous middle of the femur and tibia, is perceptibly extended towards the extremities, and terminates in both directions in *zones*, very full of red blood, surrounding both ends. These very delicate beginnings of ossification are very plainly discoverable by microscopes of ordinary power, and shew that the structure of the bone is by no means *fibrous*, but altogether *reticular*, cellulous, and flocculent, and is manifestly formed from very short lines or tracts running together at acute angles.

XV Day.

The whitish, reticulated osseous substance is much more extended towards the epiphyses. The zones of blood-vessels situate at the extremities of the ossification, are

broader and exhibit a more vivid redness. The reticulated osseous structure was very conspicuous to the naked eye. Splitting the femur and tibia in their length, the internal part of the bony tube was formed of reticulated matter—the walls of the tube throughout their whole length were downy or flocculent, having no vestige of tables or lamina arranged over one another. But the blood-vessels which went from the zones, in their course, both in giving and receiving the *little twigs*, follow precisely the same order, and exhibit the reticular appearance.

XVI Day.

The reticular osseous structure of the femur and tibia reaches nearly to the epiphyses—even on the cartilage which tips the extremity of the bone, a rough surface is visible, which is the rudiment of the future bone—and nothing is wanting to change this roughness into real bone, but the deposition of earthy particles. The redness of the zones is greater than on the fifteenth: from either extremity of the bone towards the middle it is increased and expanded, so that the whole bone seems suffused, as with a sanguineous dew. The femur being split through its length, gave no indication in any part of the bony tube of a lamellated structure, but every where appeared flocculent, reticulated and cellular.

XVIII Day.

The reticulated osseous crust occupies the whole of both bones, except a small part of the cartilage on the extremities of the tibia and fibula. The superior and inferior vascular zones are very much expanded, and nearly meeting and intermixing with each other in the centre, tinge the whole femur and tibia with redness. Both bones being split in their length, their walls throughout appear alveolar and cellular, and also stronger than in the sinuosity of the femur of the opposite side. The tube of both bones was here and there interrupted and confined by cartilaginous partitions. The internal periosteum, composed of many blood-

vessels collected together, was intensely red. But near the epiphyses, the cartilage which remained of the diaphysis of the whole bone, was elongated in the form of a cone in the medullary tube, or bony pipe, which cone gradually terminated in a point near the middle of the bone. Through this cartilaginous cone on the extremities of the bones, some vessels passing from both *zones*, reach to the epiphyses with a bifurcated termination. The frontal bones were still very flexible, and almost cartilaginous, yet were in no point fibrous, but in all parts manifestly *reticulated.*

XXI Day.—A chicken near being hatched.

The femur and tibia were not so red externally, and nearly as on the former days. In the middle of both bones the reticular structure was more close and compact than usual, and the lines appeared to run together at more acute angles than on the first days after incubation—hence it happens that those small tracts concurring at acute angles, readily deceive superficial observers, as if they were fibres extended in the length of the bone. The femur and tibia being vertically divided, the internal periosteum presented, covered by an oily mucus, and the medullary tube was filled by small cartilaginous tubercles. But in the extremities of the same bones, the cartilage which rose in the form of a cone through the bony tube, was changed to a pellucid sponge of cartilaginous elasticity, grooved by oblong depressions and sinuses. It necessarily follows, from the evolution of this conical cartilage, and from the separation of the same into pits and cells, that the proportion of the protuberances is very much increased at the dyaphysis of the bones, on account of their greater amplitude and the swelling of this *conical cartilage*, which far exceeds the diameter of the bony tube.

A chicken two days before being hatched.

There was nothing of cartilage in the extremities of the femur and tibia, except the epiphyses. When the periosteum was removed, the blood-vessels appeared every where mixed

and interwoven with the bony network. Both bones being divided as usual, the internal periosteum was very red, and the vessels of the marrow bedewed with much oily mucus, were extended from the extremities toward the centre of the bone. In the middle of the femur and tibia, where, from the commencement of the ossification, the whole external surface of the bony tube was downy and flocculent, now a hardened covering is seen in the middle of it, manifestly drawn and crowded together in tracts and areolæ of reticular structure. The *cartilaginous cone* which I saw on the former days in both extremities of the bone, drawn out into depressions and little circles, and very tumid, now I find has become a fragile bony sponge forming the protuberance of the bones. Moreover, I again see red vessels pass from both extremities of the bone to the epiphyses, to form the ossification of their cartilaginous appendages in the usual way.

Thus far the observations were made on the incubated egg. The original structure of the bones of human embryons when about twenty-eight lines long, was entirely similar. For in this, as in the chick about the fourteenth day of incubation, the middle of the femur and tibia, which scarcely equals two-thirds of the whole length of the bone, was osseous—the remainder was cartilaginous. The external surface of both bones stripped of the periosteum, and examined with the best glasses, appears beautifully reticular, very short branching lines running together at acute angles, altogether resembled the first evolutions of the bones in the incubated egg. The embryon bone split through the middle, exhibited the downy and flocculent substance both internally and externally. Although the frontal and occipital bones were so pellucid and flexible that they appeared entirely cartilaginous, yet the minute structure was manifestly reticular—both the whole of the scapula and ilia were spongy, being still uncovered with any harder external covering.

The conclusions which are to be drawn from these observations, unless I am very much deceived, are the following:—

1. That the cartilages were the models of the future bone, and all the parts of the bone visible, existed in the form of cartilage.

2. The reticular or cellulous bony structure which first began to appear about the middle of the cylindrical bones, was always immediately preceded by a wrinkling of this part.

3. That the cartilaginous model is changed to bone by the action of the sanguiferous vessels and the addition of earthy matter, in the rugose cartilaginous tracts, by which means the osseous network is made.

4. In the incipient state of ossification the whole height and thickness of the bony pipe of cylindrical bones, both without and within, is light, downy and cotton-like, having no trace of hard covering externally.

5. When the ossification is perfected, the walls of the cylindrical bones receive an increase of density about the middle of the bone, with a diminution of its breadth, as the *reticular texture* is more closely drawn together than before, and compacted in the tracts and alveoli. What forms the external crust or cortex of the bone, is nothing more than the light, reticulated cellulous structure brought into a hard body near the surface of the bone, and this, both in the cylindrical and flat bones, does not appear about their middle or centre, before the entire ossification of the cartilaginous model.

6. The sponginess, which is greatest in the extremities of long bones, is by no means derived, as many anatomists teach, from those lamina, or tables, which pass from the walls of the bony tube and go into the medullary cavity, but it is to be referred to the primordial cartilage, which at first stretches the *cones* upwards through the medullary cavity, and at length the areolæ and cancelli being removed, expands more fully, and swells very much like tuberous sponge in the extremities of the long bones.

7. Finally, the original more minute texture of the cylindrical and flat bones, both in the incubated egg and the very

early human fœtus, (when indeed both the bones, scarce begun, are still flexible and light) are nothing but a slightly reticulated or cellular substance—and moreover, if sometimes distinct little spots, remote from the centre of ossification, occur in the progress of ossification, they are at length consolidated and peculiarly interwoven with the portions next them, the whole bone being thus formed by retiform structure.

In the next place, since we find this to be the fact in the first evolution of bone, let us consider the more minute structure of the bones in detail—especially the nature of the *cortical* substance of the bone, which is most manifestly made up from the osseous network compacted—this, which has been detected by the synthetic method, I feared not to be able to confirm by analysis, as the hard external of bones may be wholly cleared of their earthy particles, and then being gradually softened, their peculiar structure can be fairly shewn.

Therefore I kept the tibia of an adult man in dilute muriatic acid sufficiently long to extract the earthy particles—by this process, common to anatomists, the very hardest bones are converted into a cartilaginous substance of great flexibility and translucency, without in the slightest degree changing their natural forms. When I had reduced these bones to this state, I macerated the cartilaginous residue in pure water, in the same manner as is done when we wish to reduce membranes, viscera, skin, tendons, or aponeuroses to cellular substance. By a long continued experience, I have at length learned to reduce the external covering of the tibia of an adult to a downy reticular texture, similar to that which is found in the extremities of the bone, except that the close and much compressed texture of the cortex, appears loose and dissolved in the meditullium and tuberosity of the same tibia. In fact, when the parenchyma of the tibia was cut perpendicularly, no vestige was found either externally or internally of fibres—not the slightest trace of lamination, or plates, in the thickness of the

bony tube—but the whole and hardest crust of the tibia throughout its extent, appeared to be formed of *cellulous* structure, so disposed in cancelli and tracts of network, that what belonged to the superficies of the tibia was much compressed and gathered on itself, and the cancelli gradually relaxing, and enlarging more and more, until they were swelled out to that sponginess found in the medullary cavity and extremities of the bone.*

I have with much pleasure observed that the compact substance of the tibia now under consideration, is of a cellulous reticular structure, when this cortex has been deprived of its earth and moisture, and afterwards placed in oil of turpentine. For on account of the high degree of pellucidness of a bone thus treated, the slight network of which it is ultimately composed, may be clearly seen—and the naked eye can discover without error, that the very hard crust of bone is really of a cotton-like texture, and made up of very short branching tracts, variously joined and interwoven.

The same circumstances were manifested by a section of the very hardest portion taken from the middle of an adult tibia, suspended in spirits of wine after the earthy matter was removed, and carefully examined by reflected and refracted light. The soft cellulous texture was shown, in which small cones of the same soft substance of different figures adhering together, formed here and there larger and smaller areolæ, nearly like the soft cellular texture.

The *reticular* structure is not only to be seen in the cylindrical, but also in the compact tables of flat bone in adults. Thus the internal and external crust of the frontal and occipital bones, being made flexible and pellucid, and suspended in oil of turpentine, the whole is found to be in every part *reticular*—so great is the resemblance of this

* I have repeated all Scarpa's experiments on adult bones, and have examined in the same manner the very hardest parts of the cylinder of the thigh bone. The results have been so uniformly similar to those above related, that it is not possible to avoid adopting the author's conclusions.
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crust to the structure of cellular texture, that it might readily be mistaken for a membrane reduced to a cellular web, by long continued maceration. However, I have remarked the form of the cells in the crust of flattened bones, to be different from those peculiar to the network of cylindrical bones—that, for instance, the areolæ in flat bones are more oblong than in the cylindrical—as if the cellulous spaces and areolæ of the flat bones had been drawn in different directions, while the bones were yet soft and cartilaginous. Hence analytic examination of the cortex of hard adult bones, shows that there is almost the same disposition of principles in the construction of the hardest parts of bones, as in the embryo at their first evolution, and the conversion of cartilage into bone—that all the bones, even the very hardest, are composed of a collection of small tracts, which extend through very short spaces, and unite at different angles, *forming a network.* It is not from conjecture, therefore, but the force of positive observation, that we declare the opinion hither taught in anatomical schools, that bones are formed by tables, lamina, and filaments, is unfounded, and must be rejected as untrue—and we affirm, that all the bones, whatever be their figures, are in their minute structure *cellulous* and *reticular*, sometimes very close and compact, as in the cortex of very hard bone—at others, loose and free, as in the cavities and tuberous extremities of cylindrical bones. Those short tracts which anatomists have mistaken for bony fibres, can neither be followed in the length or breadth of the bone, nor do they ever attain any notable length.

In fact, as often as I attentively examine the minute cellular texture under consideration, and observe that it is very close and compact at the surface, and grows gradually looser and looser as it approaches the internal part, and the spaces and cells become very much larger, and at length form the spongy structure of the meditullium, and extremities of the bones, I cannot avoid concluding that there is in this construction of the bones, a great resemblance with the texture of the true skin of animals. For this corium,

which is beyond doubt of a cellular texture, where it covers the external surface, has its cells drawn together and closely compressed, is very firm and compact, but its internal surface has its cellular structure more and more relaxed and enlarged, till at length by the introduction of air it is easily swollen, the sub-cutaneous network is loosened and enlarged—thus in bones I see a cellulous *network*, very close and firm on the outer surface of the bone, form a hard crust, and the same substance gradually becoming loose toward the centre of the bone, enlarging and swelling out to an osseous sponge.

Since then it is demonstrated, that the minute structure of the crust and meditullium of bone is entirely the same cellular structure, it will not be difficult, unless I am much mistaken, to understand why the cylindrical bones of very young fœtuses, which in the beginning throughout the whole extent of the walls of the long tube, are equally light and cotton-like, should, with increase of age, be externally covered by a hard and compact crust—also why it happens that the cortex of the bone is uniformly in inverse proportion to the meditullium, or what is more remarkable, why the cortex should be thick and very hard where the spongy substance is in smallest quantity—and on the contrary, the cortex is slightest where it covers the greatest quantity of spongy texture. From what I have advanced relative to the inception of ossification in the incubated egg and in the human fœtus, it appears that, perhaps, a greater quantity of osseous substance does not exist in the middle of cylindrical bones than in their extremities, but that such is the condition of the cartilaginous model of the future bone, that the portion of this cartilage belonging to the extremities, which hardens latest, is more extended and spread out over larger spaces alveoli and depressions, than the middle portion of the cartilaginous model. Therefore, since the texture of the cortex and meditullium is entirely the same as before stated, *reticular* and *cellulous*, nature in her own way and at the proper place, as in the middle of the cylindrical bones, constringes and compacts it to form a hardened

cortex—but in other parts, as in the tuberous extremities of bones, she loosens and spreads the same material like a sponge. In fact, no one should think this compaction and change of a lax cellular texture into a solid and hard body to be the only example occurring in the animal economy, and merely contrived and designed for giving strength to the bones, since nature employs exactly the same means in all animals, and in all organs composed in a great degree of soft cellular texture, for keeping them in their places, and giving them more solidity and strength. If this should appear doubtful, nature herself teaches, that the softest membranes of the embryon are changed and hardened into firm tunics, elastic ligaments, and tendons, articular capsules, and vascular tunics. Those who have hitherto supposed the minute structure of bones to be formed in strata and tables, have been accustomed to support their notion by imagination, fancying that the middle of every cylindrical bone, where it is hardest and firmest, to be composed of numerous tables, and as they gradually recede from this tabulated centre towards the extremities, they are diminished in length, and those that are turned towards the medullary cavity are so inclined, that at length meeting together in the middle of the bone, are in a multiplex manner admixed and interwoven with each other, and changed into the spongy substance of the meditullium and tubers. The whole of this hypothesis falls of itself, if the facts are properly weighed, which we have demonstrated relative to the *cellulo-reticular* minute primordial textures of bone. Moreover, even were this tabular structure admitted, it would be impossible to understand how the same strata of bone could be driven, as *Haller* thinks by the dilatation of the arteries, from the superficies of the bone towards its medullary tube, till at length by their meeting, the form and condition of a spongy mass is produced.

But although the natural course and order of ossification is, that the *cellulo-reticular* substance which is placed in the middle of the bones, should change with the maturation of the animal, gradually contracting its cells, and hardening

the little portions of cellular texture—and while solidifying the cellulo-reticular structure of the extremities and tuberosities, at the same time extending the cancelli, and enlarging the network, so as to increase the whole size of the bone—nevertheless, observations furnished by pathology are not wanting, to show that a faculty and aptitude exists in the very hardest cortex of adult bones, which enables them under certain circumstances, like the cellulous structure of the extremities, to swell and enlarge beyond their natural condition.

Although I had suspected that this remarkable power of nature in relaxing and enlarging the external covering of the hardest bones, was often resorted to by her in curing diseased bones, yet I never was so clearly and undeniably satisfied of it, as in the case of a puppy, whose leg I had freely broken. I opened the tibia of this dog, down to the meditullium, and by this opening, introduced a probe and destroyed the marrow of the bone, filling up the cavity with lint, not without much injury to the inner wall of the tube. On the following day the whole leg swelled violently. About the sixth day, a free discharge of pus ensuing, the tumefaction of the soft parts about the wound subsided—the tibia at the same time was found to be very tumid, and gradually to increase in size, until about the fortieth day, it had the appearance of a great exostosis. The dog was killed, and this tibia was examined by cutting through its length, when the whole of the cortex was found to be expanded to *cellulous* texture—and moreover, the walls of the tibia of this puppy that were scarce half a line in thickness, were now changed into a spongy substance, of more than six lines in thickness throughout the length of the bone.

Similar circumstances are frequently found in the human race, sometimes, as when any cause injures the meditullium, leaving the cortical part untouched, or when the nutrition and increment of the bone from the internal texture is injuriously hindered by the presence of some foreign body. In either case nature provides for the preserva-

tion of the continuity and strength of the diseased bones, relaxes with great effort their compact external surface, and enlarging to a spongy consistence, which being prolonged internally, compensates for the loss of the meditullium—or swelling outwards increases the height and breadth of the bony tube—or, at length by surrounding the injured bone by the sponginess from the cortex, it is received and contained in a sort of sheath. This spongy sheath in the beginning is light, flexible, and cotton-like, but gradually hardening by the acquisition of earthy matter, comes at last to perform the office of the sound bone—the primitive bone wastes away, and at length loses its continuity with the osseous case.

We may reasonably demand of those who teach that the hard walls of bones are made from many plates or tables superimposed, how they can reconcile such facts with their hypothesis. For it is certain and manifest under the circumstances mentioned, that the bones neither separate into layers, nor, properly speaking, does nature generate a new bone to replace the meditullium, or to include the injured internal wall in the bony sheath, but only allows the compact and much compressed texture of the outer part of the bone to become freely enlarged and expanded.

But while engaged in writing this essay, I have before me another most excellent example of this change and transition of the compact substance of the bone into a cellular mass, furnished by the bones of children, in whom the hardest parts of the bone, and especially of the joints, are reduced by disease to the softness of wax, and become almost pellucid. In consequence of this disease, the bones being deprived of their earthy particles, or the necessary deposit of earth withheld, grow at last so soft and pellucid, as to be easily cut with a knife, exactly like those bones which have long been macerated in diluted mineral acids. Diseased bones of this kind have their substance like cartilage, very light and flexible, and more delicate and spongy within than it is possible to describe. Having cut one of them through its length and suspended it in spirits of turpentine,

it was translucent like jelly, exhibiting the minute structure throughout reticulated, and particularly evinced and confirmed the fact of the cellular structure of the external crust of bone.

While speaking of bones deprived of their earthy matter by disease, it presents a fair opportunity for observing what happens sufficiently often, that bones from some peculiar virus may become diseased, not throughout the whole body, as in general rachitis, with softening, but are deprived of their earth in a particular spot, and are affected by a local rachitis, making them soft within certain defined limits. Where this occurs, the cellular texture of the bone loses its character and rigidity as bone, at the point whence the earthy matter is removed, and assumes the flexibility and ductility of cartilage, becoming subject to distension and swelling, like the soft organs, such as membranes, tendons, ligaments vessels, and other parts composed of cellular substance. Under such circumstances, if the softened bone is exposed by the want of an outlet to the action of acrimonious fluids, it swells, becomes violently distended and red, and soon forms an irregular fungous mass, similar to excrescences of diseased flesh.* The phenomena of spina ventosa and pædarthrocace, are well known to surgeons, the bones at first softening so slightly as by no means to allow of the introduction of a probe—at length becoming a sort of fleshy matter, the skin is burst up and presents a wretched spectacle—the tumour bleeds on the slightest touch, and pours out a fetid discharge. This change of the bone into

* In one case to which I was called, there was an enlargement of the tibia about two hand-breadth's below its head, with a large opening through which an ill-looking fleshy mass could be seen within, and from this opening a very unpleasant discharge was kept up. The patient about fifteen years old, suffered greatly, was extremely emaciated, and had regular hectic paroxysms A probe could be passed in any direction through the diseased part of the tibia. When the foot was raised it was evident that both bones were fairly softened, and might be bent almost to any degree. Amputation was recommended—some delay was occasioned. The patient began to take bark freely for the debility, and in a very short time entirely recovered. J. D. G.

a substance similar to flesh, and its easy distension, shows that there is much similitude between the cellular texture of the substance of the bone, and the common cellular texture, whose great ductility and the facility with which it forms fleshy tumours, is equally well known to physiologists and pathologists.

Sometimes it happens fortunately, that the bones swell to an extraordinary size, from the softening of their cellular structure, without injury to the animal. In fact, we think in opposition to the common opinion of surgeons, that this peculiar softening and germination, like fleshy substance from bones, is determined and promoted by a salutary effort of nature, to repel injuries done to the bone, or to restore the continuity when it has been broken. After fractures we see the points of broken bones first grow soft by the absorption of the earthy matter—afterwards from these points, already of a cartilaginous flexibility, we perceive a red substance to sprout forth, called by Celsus *caruncula*—and this caruncle extending according to the displacement of the broken bones, assuming various sizes and forms, connects the points together and fills up the vacancies caused by any loss of substance. In the living state this caruncle is red, but after death, being freed from blood and macerated, has the appearance and character of cartilaginous substance. In the living body this caruncle is well supplied with blood-vessels, which deposit earthy particles, which gradually impart greater consistence and proper osseous character, when the name of *callus* is bestowed on the mass by the surgeons.

In relation to the organic nature of *callus*, my own experiments, after those of Detlef, Haller, Bonn and Bohmer, do not allow me to doubt. Those who have heretofore taught that *callus* was something similar to gluten concreted with earthy matter, always appear to me to have very rude notions of the animal economy, and have not remarked that *callus* once formed in young animals, grows as it advances in age in the same proportion as the other bones, and is changed in colour by the use of madder, just as they are.

The blood-vessels of *callus* may be minutely injected: and in short, callus when acted on by mineral acids, is deprived of earthy matter and resolved into a cartilaginous substance similar to the other undoubted bones. Such teachers, moreover, seem not to have observed, if it has happened before them, that when bones formerly joined and restored by *callus* are seized by rickets and softening, this *callus*, like the other bones of the animal, becomes softened and preternaturally tumid.

I have removed from the surface of the tibia in a full grown man soon after death, a portion of *callus* almost four inches long and one broad, still soft, altogether cartilaginous and easily cut with a knife—this specimen is preserved in spirits of wine. Its external surface has the appearance and form of the osseous crust—but the internal surface that adhered to the tibia, exhibited a most beautiful network, which at first sight could not be distinguished from common cellular substance. By examining this structure with a microscope of high power, it was plainly demonstrated to be cavernous, and altogether cellular, having many very minute earthy particles in it, especially in its external surface, which was firmer and more rigid than the opposite side.

It is wonderful to see the celerity with which the soft caruncle, filled with blood-vessels, shoots forth on the bones of birds that have been stripped of periosteum, first changing to cartilage, afterwards into a light downy bone, delicately reticular both externally and internally.

I have made the same experiments on the bones of kittens, which though not effected with the same celerity, yet terminated in a similar manner.

The tibia of a cat, from which a soft *callus* had grown after the periosteum had been removed from two-thirds of the whole circumference of the bone, was macerated in muriatic acid until the whole bone became pellucid and flexible. By placing this bone in oil of turpentine, I found that the *caruncle*, or rudiment of the future *callus*, was continued from the cartilaginous model of the bone, and was nothing

more than a germination and intumescence of the cartilaginous substance of the tibia. I have seen the same thing plainly in the tibia of an adult man, who had suffered a vast laceration of the soft parts and periosteum, two months before death—the caruncle was sufficiently produced, and part of it had begun to change to bone. When the whole tibia was freed from earthy particles by the aid of mineral acid, and rendered pellucid, it appeared that the perfect *callus*, as well as the caruncle, formed one and the same substance with the whole parenchyma of the tibia—that is, the cartilaginous nucleus of the tibia was expanded into the *callus*, and was prolonged and stretched out uncommonly.

In another cat whose tibia was deprived of a long and broad portion of periosteum, a recently formed *callus* swelled out—when I had filled the arteries very minutely with red wax, this *callus* was handsomely tinged red, and the colour was distinct from that of the rest of the tibia. But when I had removed the earthy matter by acids from the whole tibia, and rendered it soft and pellucid, and examined it opposite to the light, I discovered an immense number of blood-vessels scattered through the *callus*.

Besides the proofs heretofore given, that the *callus* is formed by the intumescence, or germination, of the parenchymatous cellular texture of the bones, we may add, that whether we consider the formation of *callus* and the process of ossification, or look to the minute structure when the bone is perfected, we shall find all the circumstances of the original ossification and formation of *callus* alike. The caruncle does not harden by the whole quantity of earth being deposited at once, but receives the earthy substance as in the formation of bone in the incubated egg, where the blood-vessels appear, carrying red blood, and supplying at the same time the necessary earthy particles. Since this condition of the vessels takes place unequally, as well in the cartilaginous model of bones as in the rudiment of future *callus*, it hence necessarily happens, that in both, small distinct spots appear at the commencement of ossification without any order, which finally unite together in the

cartilaginous model of the embryon, or after fractures cover up and take place of the caruncle. As soon however as the caruncle is wholly ossified, we find the *callus*, like the original ossification in the incubated egg, entirely cotton-like, reticular, spongy, and equally light and delicate throughout its whole extent. It appears as if forcibly compressed, and becomes more and more condensed until it hardens and is covered with an external crust or bark, which substance, as in the bones of embryons near the full time, increases more in length in proportion to the diminution of the celluloreticular structure.

The origin of *exostosis*, is undoubtedly similar to the formation of *callus*. For in such cases, the surface of the bone being, for ever so small a distance, deprived of the periosteum, becomes softened, is followed by a germination of the caruncle from this spot, which is lengthened and increased from the fluids circulating in it—hardens finally by the deposition of earthy matter, and produces a tumour whose minute structure does not differ, in the slightest degree, from that peculiar to the bones, if we except this circumstance, that the tumour is sometimes harder than the bone itself, in consequence of the greater quantity of earthy matter it has received. I speak now of the true and legitimate exostosis, which may have been originally caused by some virus—and although this has, by treatment or spontaneously, been removed, still the exostosis does not cease, because the caruncle shooting from the surface of the softened bone, obtains the nutritious gluten along with the earth from the common cement, and assumes the osseous character. A few years since I had occasion to remove the tibia and fibula near the knee, where a great exostosis swelled out, in a man of about forty years. I amputated the leg at the usual distance from the patella, through the exostosis. The wound in a short time was healed without being affected by the *exostosis*—the cut bones adhering to the integuments were covered by a firm cicatrix.

Caries is separated from the sound bone almost always in the same way that *callus* is formed. At the extremities

of a bone suffering under caries, the earth is absorbed by the action of the proper vessels, and from this spot the caruncle shoots forth, which being treated with bland and emollient applications, separates the carious bone in every direction, and throws it off from the sound. When this happens, the caruncle which, as we have demonstrated, is very vascular, before it wholly ossifies, forms anastomoses with the surrounding soft parts, and even with the skin itself. On this account, after the cure has been entirely effected, we find about this caruncle, that the integuments are attached to the subjacent bone, and that there is a dense concave cicatrix formed thereby.

Therefore, in addition to the anatomical researches, and observations made relative to the formation of fœtal bones, and their structure in adult animals, various morbid affections, the chief of which I have mentioned above, show that the minute structure of the hardest of these organs differs very slightly from the structure and properties of cellular texture, if we except that the common cellular substance is very soft and juicy, and the cellular texture of bones in consequence of the earth it receives, begins early to harden, and has its strength and density increased by the daily addition of earthy matter. It is nevertheless equally certain, where the cellular texture of the bone is first deprived of its earthy particles, it becomes flexible and ductile, like many other parts of animals which are called soft and distensible, having as great an aptitude to swell or enlarge as the common cellular substance. As sometimes it happens in ulcers which are treated by an unskilful surgeon, by oily and relaxing remedies longer than is proper, the cellulous subcutaneous texture swells and rises above the skin as a fungus tumour, so it naturally occurs when first the cellular texture of bone is deprived of its earthy matter, the same vital action forms and germinates the caruncle, which sometimes only unites the points of a broken bone, and at others, wonderfully replaces the material that has been lost. The celebrated Haller formerly taught, that the cellular texture was the great foundation of the animal structure, because

all the membranes without exception, the vessels which are hollow membranes, the greatest part of the viscera, tendons, aponeuroses, ligaments and integuments of the whole body, are made of this cellular texture. This is not only true, but an addition of the bones may be made to this catalogue, on the authority of the most careful observations.

I have taken care to examine the minute anatomy of the bones in other animals, as in amphibia, reptiles and fishes. In the great whale called balæna mysticetes, the cellulo-reticular structure is most fully evident, both in the bones of the head and shoulder blades, and in the cortex of the lower jaw, and the longest of the ribs. There is no great acuteness of sight requisite to detect the same structure in the bones of the delphinus phocæna, because the reticular structure in this animal is more visible, since there is but a small quantity of earthy matter concealed in it. The same structure is very manifest in the bones of the sea turtle, and in reptiles of every kind. In cartilaginous fishes, as the shark, frog-fish, sting-ray, and others of the same kind, whose bones contain even less earth than those of the dolphin, the reticular texture of the cortex is also far more conspicuous. In the scaly fishes, as in the pike, although the bones are very hard and contain much earth, yet the cellulous texture is very perceptible, and the branching tracts concur at acute angles, wonderfully and beautifully reticulated.

The salutary changes which we have mentioned heretofore as occurring in the bones, being effected and continued by the vital power and action of the vessels, it follows, as every one sees, that the bones, besides the great quantity of lymphatic vessels, are also possessed of a vast number of blood-vessels, and are really more *vascular* than any one not accustomed to minute anatomy can have any idea of. The celebrated Albinus, indeed, taught a long time since, that a vast number of vessels passed from the periosteum into the cortex, through the numerous spiracles of Havers, and these vessels, with others of the same character running through the meditullium, properly

called nutrititious arteries, anastomosed, and passing by particular openings through certain parts of the bony crust, enter the medullary cavity, bestowing the most minute ramifications on the marrow and its membranes. But ALBINUS, when he wrote this, thought that the blood-vessels immediately after entering the pores of the cortex, went in right lines between the strata of plates and tables. This I certainly know to be far from the truth, and foreign to the structure of the bones and the real distribution of the blood-vessels. When I had filled the vessels of the bones in a young and immature fœtus with most minute injection, I found the vessels of the periosteum immediately on entering the pores of HAVERS, not going off in right lines, but giving and receiving frequent branches, *encircling the reticulated structure of the cortex*, and joining each other at the shortest intervals, following the course of the osseous network. Where the cortex of the bone internally began to loosen to the spongy substance of the meditullium, the blood-vessels of the cortex also inclined to the centre, and their trunks joined at certain places, with those going to the marrow, as before stated. This seems to be a wise provision of nature, that at the same time, the external crust of the bone is supplied with a large quantity of blood, a full and manifold communication should exist by these almost innumerable anastomoses, between the external and internal structure. I pointed out the mode of distribution of blood-vessels in bones, as shown by injections, in the incubated egg of the sixteenth day, when the *red zones* which surround both the extremities of the tibia, being broadly expanded, meet in the centre of the bone. Under these circumstances, even should the external periosteum be removed, the cortex of these delicate bones is suffused with so great a redness by the abundance of vessels, that it seems to be covered with a sort of sanguineous dew.

Since the bones enjoy vitality, are nourished and grow like other parts, it is in perfect agreement with analogy to believe, that besides the great quantity of blood-vessels, they are supplied with nerves, although these can scarcely

be demonstrated, not only on account of their tenuity, perhaps—because, as in many other parts, the very small nerves enter the foramina of bones in coalescence with the arteries. But if pathological observations may be allowed any weight, I may state, that I have more than once produced a sense of pain by scraping and abrading living bone. I have also observed that the *caruncle* which shoots from the substance of bones is endowed with sensibility, and have lately had a most excellent opportunity of confirming this statement. On the tibia of a man, five inches long and one broad, that had been removed by the natural process—I wet the caruncle with camphorated spirits of wine, of which the patient, who was by no means timid, complained much —shortly after, I wet the point of a soft pencil with spirits of sal ammoniac, and when it was applied to the caruncle, the patient cried out. Now that the caruncle, which is nothing but the bone itself deprived of earthy matter, is entirely insensible and destitute of nerves, it is altogether absurd to assert.

The following questions may be asked relative to the minute anatomy of the bones. Is the *diploe* present in the cranial bones of the fœtus or not? Are the pituitary sinuses altogether wanting in the bones of the fœtus at full time? that is, are the *frontal*, *æthmoidal*, *maxillary*, and *sphenoidal* present? relative to which anatomists are yet undecided.

In relation to the first question, if any one attentively examines a perpendicular section of the cranial bones in an immature fœtus, with the aid of a good glass he will find a very singular and remarkable circumstance. The *reticulated cellulous* texture of the fœtal cranium on the inside is already solid, smooth and compact, and has already formed that table which is called *vitreous*—but the external surface of the same cranium still remains light, reticular and flocculent, as it were surrounded by an osseous down. After birth, and especially in childhood, this reticular down is in greater quantity, the cancelli and areolæ are more and more drawn together, and solidified into a thin crust under the pericranium. This crust, moreover, en-

velopes the whole reticular substance of the cranium, and whatever remains after the formation of the two tables is confined between them and receives the name of *diploe*. If the ossification advanced beyond the middle, the portion of the reticulo-cellular substance between the two tables would be added to either the external or internal, and then the adult cranial bones would be entirely without *diploe*, but would constantly acquire a hardness and thickness beyond what is common. Wherefore, so far is it from fact that the *diploe* is wanting in the fœtus, that it should rather be stated that all the external surface immediately under the pericranium is nothing but *diploe*.

In relation to the pituitary sinuses of the nose, among the dissectors who affirm these cavities to be entirely wanting in the fœtus at nine months, (for many anatomists are of this belief,) some teach that these receptacles in adults are to be attributed to the action of absorbent vessels. For, say they, the material is absorbed from the middle of the frontal, sphenoid and maxillary bones, and is replaced at the margin forming new and large cavities. I freely confess that there is much excellent testimony to prove the great power which the absorbent vessels possess in removing both fluids and solids. Nevertheless, granting all this power to the absorbents, I do not understand why they do not equally remove the whole substance of the bone, as well as make local excavations at certain points. But passing over these disquisitions and doubts, we cannot withhold our admiration at some of the recent writers on osteology, who deliver it as thoroughly investigated and certainly established, that these sinuses are wanting in the fœtus at birth*—not recollecting

* What would Scarpa think of the positive assertions made very recently, and worst of all, *republished* in *Philadelphia*, that the frontal sinuses do not exist in every individual—and that "a gentleman of the medical profession, who had *finished* his studies at *Edinburgh*," dissected carefully at *Paris* for "*seventeen months*," and could not find the FRONTAL SINUS, except in a single instance, and that in the head of a "mad woman!!" See Combe's Essays on Phrenology, p. 83 passim. J. D. G.

that the celebrated Albinus has described many of these sinuses in the fœtus of nine months, and illustrated them by plates. In fact I have before me, in a fœtus of this age, the *æthmoid* cells as delineated by Albinus, and also the *maxillary* and *spheno-basilar* sinuses proportionally as distinct as in the adult. The spheno-basilar sinus, at this tender age, is not only begun, but it is already fairly divided into two parts by an interseptum. The frontal sinus is the only one whose rudiments are obscure in the fœtus of nine months, yet it is not entirely wanting—but at that age the frontal sinus is not sufficiently distinct from the æthmoid cells, as is shewn by the flatness above the nose in the fœtus, and the formation of a continued series between the frontal sinus and æthmoid cells in the adult.

The pituitary sinuses of the nose, like many other parts which are delineated in the embryon, are only evolved with the increment of the whole body. For the purpose of effecting this, in addition to the remarkable powers through whose action the nutrition and increase of the animal organs are kept up, I think that faculty of the animal economy by which the primordial, light, reticular and cellular texture, at certain places and different periods of time becomes more condensed, or relaxed and spongy, as may be necessary, does much in the increment and evolution of the pituitary sinuses. Indeed, in the first instance, it is necessary from mechanical necessity, that the cavity surrounded by the osseous sponge, which is contracted and changed into a hard thin crust, should be increased. This is certainly manifest in the cylindrical bones, which are spongy and cotton-like throughout their whole extent in the embryon, and as soon they begin to harden and form their cortex in the middle, the tube of the bone becomes apparent.

In addition to the causes stated above, it is very probable that another circumstance takes place in the increment and evolution of the pituitary sinuses—that is, as the body increases, the capacity of these sinuses gradually enlarges, and the extent of the spongy bone surrounding them is in-

creased, at the same time its thickness is diminished, until this bony sponge forms the walls of the pituitary sinus. There will be less doubt in relation to this, if skulls of all ages, from the fœtus at birth to the adult, be carefully examined, in which it is very manifest that the amplitude of these sinuses are in the inverse ratio of the spongy cellulous substance of the bone, which in the fœtus surrounds these cavities. But to these causes promoting the increment of the pituitary sinuses that may be properly called *primary*, I think that those *secondary* causes should be added, depending from the change of figure and position which the surrounding bones of the embryon are subject to.

The convexity of the superior and middle turbinated bones being increased towards the septum narium, favours the expansion of the æthmoid cells, and the appearance of the molar teeth in the child, with an increased convexity of the alveolar process, aids much in developing the maxillary sinus—in proof of which, the maxillary cavity is much lessened when the molares fall out, and the alveolar arch is removed. When the root of the nose and outer surface of the frontal bone is raised in children, this causes the æthmoid cells to be raised upwards along with them, so that the superior cells get a new place and name, and are called *frontal* sinuses. Should any one suppose the air during respiration to be impelled throughout these sinuses, I should not be much disposed to object.* I will end this essay by pointing out the propriety, in similar researches, in order to understand the most interesting articulations of the body, of employing a recent subject in which the bones are held together by their own peculiar ligaments. Experience has taught me that dissectors have often fallen into error, from want of a recent subject before them to examine and correct their notions.

* The air has access to the sinuses during respiration, when they are not diseased—but is not necessarily *changed* at every breathing, as is evinced by the occasional retention of a peculiar odour, which is proved by its reappearance after a lapse of time, and our removal from the spot where it was first experienced. J. D. G.

In dried bones, for instance, deprived of their ligaments, any one would say, judging from the appearance of the head of the bone and the acetabulum, that a man could readily move the thigh bone in every direction—could flex, extend, adduct, or draw one thigh to the other. Notwithstanding, I venture to assert, that it is most certain we have not the power of extending the femur, that is, to carry it behind the perpendicular line of the whole body. If we stand on one foot, and attempt to move the thigh behind the perpendicular line of the body, we find that we are altogether unable to accomplish it, and if we appear at all to succeed, it is only in proportion as we bend the trunk forwards above the hip joint. The unequal thickness of the capsular ligament of the hip joint, and the peculiar disposition and insertion of this ligament into the neck of the femur, prevents the extension.*

The capsular ligament below the psoas magnus and iliacus internus is very thin, and is thinnest behind, where it is covered by the quadratus femoris. But on the outer part where the capsular ligament is thickest and densest, it does not go directly downwards, but passes obliquely from the outer part above the brim of the acetabulum, and is inserted in the interior surface of the root of the neck of the thigh bone.† On account of this insertion, as we attempt to carry the femur backwards, the anterior, which is firmer and denser than the posterior part, is strained to the utmost and forcibly extended, preventing entirely the tension beyond the *perpendicular line*. That this principally depends on the unequal thickness of the capsular ligament,

* I have recently published, in a work on the Fasciæ, the discovery of the manner in which the capsular ligament of the hip joint is formed from the *fascia lata*. By reference to the description therein given, the reader will be better able to perceive the correctness of Scarpa's assertions, inasmuch as he will find another reason for their truth in the connexion which all the muscles of the thigh have with the capsule. He will also be well prepared to understand the cause of the inequalities in the thickness of this ligament. J. D. G.

† See Weitbrecht, *Syndesmologia*, Tab. xviii. fig. 53. Godman's *Anatomical Investigations*, Sec. V.

is shewn and proved by opening this ligamentous capsule on the side of the foramen ovale, and thence introducing a knife so that the round ligament may be divided—nevertheless, although in the most recent subject, we cannot perceptibly move it backwards beyond the perpendicular line. How much these facts will assist in more clearly understanding the circumstances which in health pertain to the mechanism of standing, walking, leaping, or in disease, to the diagnosis and removal of luxations of the thigh, it is unnecessary for me to point to any one at all acquainted with the subject.

ART. II. *On the Hirudo Medicinalis.* By JOHN FISHER, M. D. of Virginia.

THE introduction of the leech into the practice of medicine, was probably suggested by its having been seen to pierce the skin of animals and gorge itself with their blood. As it was found to remove a quantity of blood from the system without any ill effect, this was certainly a strong recommendation in its favour. The ancients, however, placed too much reliance on its action, as many of them ascribed to it the greatest remedial powers.

The leech was employed in medicine as early as the commencement of the christian æra. But the practice of that day was very different from the present.

By some of the ancient practitioners, leeches were recommended in gout, and by others to the hemorrhoidal vessels in various diseases. They were also highly appreciated in angina accompanied with dyspnœa, and also applied to the hips in cases of satyriasis.

Oribasius, who flourished about the year 330, in a chapter which he wrote on inflammations of the eye, proposes the application of leeches to the side of the forehead, cor-

responding with the affected part. In the progress of time they became generally employed.

Of the natural history of the leech I can say very little, as it requires both time and strict observation to collect the necessary facts. The variety of species as well as the diversity of opinion on many parts of their history, would forbid the insertion of any thing that has not come immediately under my own observation, and as I am at present totally devoid of the requisites for attaining this knowledge, I hope the few facts I have borrowed from those who have had sufficient opportunities to ascertain them, will not be unacceptable.

I shall confine myself entirely to the *Hirudo Medicinalis* of North America, and commence in the first place with its external appearance.

The medical leech of this country is of a greenish black on its back, with three rows of spots running longitudinally —one row running directly down the middle of the back, corresponding in colour with the under surface or belly, which is of a dull yellow colour. On each side of this is another row, the spots approaching nearly to a black. These spots all disappear a short time after the death of the animal.

The leech is from three to six inches in length, with one extremity much smaller than the other, which is the head. The mouth is indicated by two lips, the upper being the most prominent. From the head to the inferior extremity, the body is marked by numerous circular ridges, which are most prominent when the animal is in an extended state. About one half or three-fourths of an inch below the head under the œsophagus, are situated the organs of generation, designated by dark coloured prominences. The first prominence contains the male organs of generation—the second, which is smaller, is the female organs. Lower down we meet with four prominences, which, if noticed at all in a treatise on the leech, by Mr. Johnson of Edinburgh, are described as the brain.

The appearance of this organ is that of a gland, and by

pressure a white matter may be squeezed from it, through the orifices which open externally from these four prominences above described. A leech was brought to Mr. Peale, at the Philadelphia Museum, with four or five young ones sticking to this part.

Whether this animal is oviparous or viviparous is an interesting point. It is well known to those who have paid attention to leeches, that they never breed when kept in a vessel, as they generally are. Never having had an opportunity of seeing these animals in a state favourable for propagation, I shall insert the experience of a respectable leecher of this place, who has been in the habit of keeping both the English and American species. He states, that they are oviparous—that he has seen the egg frequently—that, at first, it is very small, but in a short time enlarges and bursts, setting at liberty twenty or thirty young ones. I am also told that they lay their eggs in the month of June, about which time they become very scarce, and it is difficult to make them leave their nests.

The leech is covered by four tunics—the cuticle, the rete mucosum or colouring matter, the muscular coat, and the internal membranous coat, or more properly the stomach.

By inflating the animal, which can be easily done by introducing a small tube into its mouth, and blowing until the strength of its muscles is overcome, we have it prepared in the best manner for dissecting off its coats. By divesting the whole surface of the external covering, we have distinctly a view of all the principal organs.

The first appearance which attracts attention is a layer of muscular fibres, about a quarter of an inch in width, on the back and belly, running from one extremity to the other. Those on the under surface cover most of the organs, though they are visible through them. Directly under this layer of muscular fibres may be observed two rows of bags or follicles, nine in each row, from which the surface is supplied with mucus to lubricate it. Between these two rows of follicles runs the principal abdominal blood-vessel.

On the external side of each row is to be seen a nerve, which supplies each follicle with a branch. On the side, exactly where the yellow skin joins with the black, is another set of organs, resembling in some degree the above mentioned follicles: they are, however, more numerous, and extend from one end of the animal to the other. These are what the ancients called the organs of respiration.

On the back, at the inferior extremity, immediately above the disc, is the external orifice of the intestinal canal—into which a bristle may be introduced without much difficulty, and by careful dissection every coat may be stripped off to the stomach, and the intestine left in its natural situation.

Mr. Johnson, whose treatise on the leech I have already cited, seems much surprised that the existence of this canal should be denied by Mr. J. Hunter and others—and in proof of its existence says, "I have several times injected a fluid from the mouth of the leech, so as to flow in a continued small stream through this very opening;" and adds, "to make it more satisfactory I have reversed the experiment, by employing a glass tube drawn out to a slender point, and inserting it into this identical foramen. Through this I have forced an injection, and thus filled the whole of the intestinal cavity."

These experiments render the point probable—yet by dissecting off the parts, and exposing the intestine, we have a clearer demonstration of it, since it requires force enough to rupture some of the internal structure to fill the cavity with a fluid through the intestine.

Though I have injected the leech with alcohol, and with water, I have been unable to make either fluid pass through the anus, even with considerable pressure. But with a small tube I have inflated the animal both by the mouth and anus. There was undoubtedly a rupture in the inflation by the anus, since the air passed in or out, after the first time, without much difficulty. Fæces may be pressed from the intestine of almost any fresh leech.

Each leech is possessed of both male and female organs of generation. These are very conspicuously situated, as

I have previously stated, from one half to three-fourths of an inch below the head under the œsophagus. The first prominence, which is the sheath to the penis, is considerably projecting, and the penis may be thrust from it to the length of the eighth of an inch or more. By cutting off this prominence carefully, the testicles may be distinctly seen, and are convulated tubes filled with a matter resembling cream in colour and consistence.

Proceeding downwards, the next prominence is the vagina, and under it are situated the uterus and ovaries. Below these organs is the large glandular mass, before mentioned.

In my description of the internal appearance or structure of the leech, I shall begin with the teeth. These are three in number, situated in the throat, and so arranged as to make an incision incorrectly described to be triangular. The precise shape of the wound is that of a straight line drawn from the centre to each angle of an equilateral triangle.

The teeth are serrated on their edges, but this is not to be demonstrated without magnifying glasses of considerable power.

When the animal attaches itself to suck, it spreads the lips in such a manner as to bring the points of the teeth in contact with the skin, and by producing a motion similar to that of a saw, the wound is inflicted.

The œsophagus is about one-fourth of an inch in length, and somewhat contracted at each extremity. The covering to this is much thicker than that of any other part of the animal, and is owing to the situation of the organs of generation, and a quantity of cellular substance in which they are lodged. The internal cavity, or stomach, may be said to extend from the base of the teeth to the inferior extremity. In this description, what I have termed the œsophagus is included, because it is completely filled with blood when the animal is satisfied.

Through this cavity are distributed numerous septa which divide it into cells. The septa in the superior two-thirds of the cavity are circular, with a small foramen in their centre, by which a communication is effected throughout

the whole cavity. Between each pair of septa are placed partial ones, being deficient both at the back and belly. The inferior third has a longitudinal division in the middle, and the septa on each side of this are partial and irregular. At the commencement of this longitudinal division is the internal orifice of the intestinal canal—it runs immediately on the upper edge of the division, and terminates with it at the commencement of the disc externally.

In organs of vision, as in many other respects, this animal differs from most others. The eyes of the *hirudo medicinalis* are ten in number, arranged under the form of a crescent, at the pointed extremity on the back part of the head. There are three other species of the leech mentioned by naturalists as possessing this sense in an equal degree. Their eyes are of a dark colour, and would escape the notice of an observer, unless the head were cut off, spread on a piece of glass, and placed under a microscope, with the favourable circumstance of a strong light.

Next I shall make a few remarks on the remedial application of leeches, and the more so, as I am convinced they are not used to the extent they deserve, especially in the general practice of the United States.

In the Dictionary of Medical Science, a writer contends that blood was drawn by him from vessels which do not ordinarily carry red blood—alleging that the wound and exhaustion attracted it into lymphatic capillaries. I object to this hypothesis for the following reasons: First, the temporal artery of a child has been penetrated by a leech. Secondly, on the fore-arm of an adult I have seen blood to ooze out from the orifices with increased force at each pulsation of the heart. Thirdly, the writer alluded to, has, moreover, fallen into an error respecting the fluid contained in the minute vessels. The blood-vessels of the highly attenuated web of the foot of the frog, are seen to carry red globules, and yet so fine is the membrane that a leech's tooth can readily pierce through it—and hence it is obvious that the vessels which carry red blood may be penetrated.

This writer further contends, that the extracted blood is entirely venous. On this point it is evident from some of the already recited facts, that he has fallen into error. He has been led astray by reasoning on a point which could be determined solely by experiment. Taking for granted the blood loses in the capillaries its arterial qualities, he supposes that the leech meets only with this effete fluid. But as before it can be despoiled, the arterial blood must enter these capillaries, it is plain that some of the fluid taken by the leech must be arterial—and even as according to his own showing, the vessels dilate to receive an increased flow of blood from the arteries, unless he can prove that an increased deprivation also concurs, we must admit the extraction of some arterial blood.

To set the matter at rest, however, let any one examine the blood as it flows from a leech-bite, and he will see that from some wounds dark blood flows, and from others a fluid of a high arterial colour. It is true, that in the stomach of the leech the blood almost immediately becomes dark and viscid, a change dependent on the gastric action of the animal, and one which cannot be prevented even by inflating the gorged stomach with atmospheric air.

There are two effects produced by the application of leeches, which gives them a superiority over the lancet—first, they empty the capillaries—and secondly, by the irritation they produce, cause the blood to flow through vessels in which it would otherwise dwell. Cups may be said to produce the same effect, but the pain is so much greater, that leeches are to be preferred.

The principal affections in which leeches are superior to the lancet or cups, are the following:

First—In most cases where the cutaneous capillaries are congested with blood, as the application is immediately to the affected part—for example the eyelids, conjunctiva, &c.

Second—When the extreme sensibility of the part diseased prohibits the use of cups, as in some cases of gout, rheumatism and phlegmonous inflammation.

Third—In diseases of continuous parts.

Fourth—In diseases of contiguous parts.

Fifth—In external affections where there is much pain.

Sixth—When we wish to produce a gradual depletion.

Seventh—Where it is desirable to produce derivation, as their bite acts like a counter irritant.

Eighth—When blood-vessels are too small to use the lancet.

Ninth—It often happens that in nervous diseases, demanding local depletion, the pain and shock of the scarificator could not be borne without hazard, and leeches may be applied without such risk.

The efficacy of leeches to the labia pudenda in cases of long standing amenorrhœa, is not to be equalled by any remedy of which we are possessed. They were used in several instances, as I have witnessed in the Alms House Infirmary of Philadelphia, and proved of more advantage than any other remedy. This application to the hemorrhoidal veins in cases of chronic affections of the abdominal viscera, is greatly superior to the lancet. In chronic inflammation of the liver, especially if it be our wish to deplete the portal system, a few leeches around the anus will be of more advantage than a large bleeding from the arm, owing to the more direct communication between the vena portæ and the hemorrhoidal veins.

In all cases in which we find it expedient to use leeches, the part to which they are to be applied should first be cleansed and then wiped dry, and a little sweet cream or sugar and water, or what is still better, fresh blood rubbed on the part. The leeches are then to be placed in a small cup not more than an inch in depth, and inverted over the part—after it has remained so for a few minutes, it is to be removed to see if they have all taken hold, taking away those that have not. If the leeches in the cup should not stick readily, the application of warm water in a sponge over the cup, will cause them to stick much more readily. By repeating this several times we shall sufficiently succeed. The leeches having satisfied their voracious appetite, they

let go their hold, and are then to be removed. If the number employed should not draw an adequate quantity of blood, cloths wet with warm water are to be put over the parts, by which means the orifices may be kept open, and the blood made to flow freely.

The expense attendant on the use of leeches is much increased, from the want of knowledge of the best mode of unloading them after they have been once used. On this greatly depends the life of the animal.

It was formerly the practice to sprinkle salt on their bodies. This sickened them, or produced violent contractions of their bodies, and thus they were forced to expel only a portion of the blood they contained But the effect of the salt is so great that their lives are destroyed in many instances. As a substitute, vinegar has been proposed, which, however, is equally objectionable.

The following is a better mode. As soon as the leech has left its place of attachment, with a cloth hold them by the tail, and press the blood towards the head, where it finds a ready passage through the mouth. This is done by most of the leechers of Philadelphia, and with great success. In this way every particle of blood may be squeezed from them, and in three or four days they may be applied a second time.

Another plan of treating them, which I have tried very successfully, is to make a puncture with the point of a lancet, on each side of the disc, at the inferior extremity. Two punctures are necessary—for, as I have previously mentioned, there is a longitudinal septum which joins the back and the belly, and prevents any communication between the two sides, except at the commencement.

It may be supposed by some, that by thus puncturing them, the life of the animal would be endangered. But so far from it, they are apparently very little if at all affected, and in a few days no trace of a puncture can be discovered.

The two modes last mentioned are surely to be preferred, and I feel convinced that those who try them all will be greatly in favour of the last.

The accidents from the use of leeches, some of the most common of which I shall notice, chiefly happen to those persons who are careless. In the first place, if leeches are applied to the gums, they may escape into the fauces, or some part of the throat, and cause dangerous symptoms. When this accident has occurred, it may be remedied by the use of a solution of muriate of soda in water, or vinegar and water, as a gargle, which will cause them to leave their place of attachment immediately. In the application around the anus they may insinuate themselves up the intestine, and also pass into the vagina when applied to the labia, &c. The same articles mentioned above will have here also the desired effect.

To check the hemorrhage which sometimes occurs from the use of leeches, a compress and bandage will be sufficient. But there are some instances on record in which the ordinary means for the arrestation of hemorrhage failed, and at length the actual cautery was resorted to. In the Alms House of this city, a case occurred which I have previously hinted at, where a profuse hemorrhage ensued, by the application of a large leech to the temple of a child only three or four days old, from a puncture of the temporal artery, in which the bleeding was with some difficulty stopped before the child became exhausted.

Leeches for immediate use should be confined in large glass vessels. In one that will hold two gallons of water, two or three hundred may be kept: but when two large a number are crowded together, they are subject to disease.

The water sometimes becomes of a bloody tinge, and still the leeches appear healthy. But should this occur after a frequent renewal of the water, they are to be separated, so as to obviate the great mortality that is likely to ensue. It is proper that the leeches be examined daily, and all those that seem unhealthy removed. The water should be changed twice or three times during a week, if the weather be warm—but in the winter season, once a week will generally answer.

Though I have advised a change of water so often, yet

there are experiments recorded in which leeches were kept in the same water for more than twelve months, it remaining pure during the whole of this time. In one instance a leech was kept nearly two years in the same water, without any disagreeable smell being evolved, though the animal was reduced to about one-third of its original size.

Art. III. ***New Division of Apoplexies.*** **By M. A. Serres,** Chevalier of the Legion of Honour, one of the Physicians of the Hospital of la Pitié, Chief Director of the Hospitals, &c.—Translated from the original by *George B. Taylor,* Student of Medicine.—(Continued from No. 15.)

> "Antequam de remidiis statuatur, primum constare opportet, quis morbus et qua morbi causa, alioqui mutilis opera, inutile omne consilium." Baillou, lib. i. Cons. XIV.

SECOND PART.

General Description and Particular Observations on Meningeal and Cerebral Apoplexies.

I COME now to state in what way I was led to find the facts which serve as the basis of the new division of apoplexies. They may be met with and verified so readily, that we might be surprised at their having escaped observation, did we not know how much the spirit of prejudice separates us from the truth in studying the natural sciences. It would not be possible always to neglect the paralysis, one of the most serious complications, in the development of the disease—thus we find it designated with great care by a great number of observers, especially Wepfer, Bonet and Morgagni. It has not been the same in regard to the absence of this symptom, whether slight importance was attached to a symptom considered as negative, or whether its

presence was unperceived because of the stupor in which apoplectics are commonly found.

Another defect inherent in a great number of the facts hitherto observed, and this is, that they have not remarked the constant relation existing between the hemiplegy and the organic alteration of the brain: we find in the annals of science many histories of apoplexy, in which a patient having before been affected by apoplexy, the brain has appeared uninjured, or has not even been examined—and on the contrary, patients who have exhibited no lesion of the powers of motion, have presented enormous cavities in the thickness of the lobes or other parts of the brain. It has even been stated that the palsy has existed on the same side with the cerebral disorganization, because the unfortunate observation of Baglivi must not stand alone. In short, some have gone so far as to say that the same alteration of the brain may produce the palsy of the opposite side, and the convulsions of the side corresponding to the organic alteration. Those who love the marvellous have received this extravagant relation, without asking how the same cause produced two opposite effects.

All such contradictory facts, which destroy each other, and lead the mind of the physician who reflects, into most distressing doubt, prove how imperfect the condition of the pathology of the brain still is—they make us equally feel the indispensable necessity of principles for the direction of our researches, where there is yet more to be overturned than to be built up.

I can only glance in this memoir at a part of the doubtful questions in the history of apoplexies—I am about to present a general sketch, which shall be followed by particular observations. I will commence with meningeal apoplexies, or those without palsy—we shall then treat of cerebral apoplexies.

(*a*) It is an established fact that apoplexies may attack all ages. I am well aware that the *authority* of Hippocrates may be opposed to me, and an opinion generally accredited among physicians—but I have observed it in all the periods

of human life, from the age of three years up to decrepid old age.

(*b*) Meningeal apoplexy principally attacks youths from the age of fifteen, and old men past sixty years of age—it affects women mostly a long time before the last mentioned period. Of forty meningeal apoplexies there were thirty-three in females—eight in males. The proportion would be still more remarkable if extracts were made from the medical registers of the hospital Salpêtrière, and compared with those of the Hospital Bicêtre during the same year.

(*c*) *Attack.* Physicians have differed greatly as to the mode of attack in apoplexies. One party have said that they always come on suddenly—the other, that the attack is preceded by precursory symptoms which are manifested many days previous. Both sides have been right, and both in a certain degree wrong, according as the cases have been meningeal or cerebral.

The attack of meningeal apoplexies is almost always slow, gradual, preceded by various precursory symptoms—the most constant of which are a state of general torpor—a difficulty in making intellectual efforts—mental weariness from the slightest occupations—obtuse perceptions—overpowering drowsiness—the respiration is slower than ordinary—the circulation very tardy—the heat less than is common—the general secretions diminished—the digestive functions weakened—and sometimes, (according to Morgagni, Ep. 1. No. 4.) spontaneous vomitings precede the attack.

If the apoplexy supervenes, on a suppression of a habitual discharge, a cutaneous eruption of an exanthematous fever, or a blow on the head, or a fall on the same part, its development is much more rapid, and in the last case a general pain of the head precedes the fit.

In many of the apoplectics I have treated, the gradation has been so imperceptible that one might suppose the patient to be plunged in a profound sleep when the apoplexy was actually present. What distinguishes apoplexy from sleep? In sleep the respiration is slow, and the circulation

is in a relative condition—in apoplexy the balance between these two functions is destroyed. The frequency of the pulsation is contrasted with the slowness of the inspiratory motions. The character of the pulse varies according to the age and strength of the patients—but this discordance of action between the respiration and circulation never varies—in proportion as this discord is evident the coma developes—the stupor is at its highest degree when in the paroxysm this difference has arrived at its *maximum.* I will describe an apoplectic paroxysm in order to render the circumstances more evident.

FIFTEENTH OBSERVATION.

(*d*) A woman of sixty-two years was in the fourth day of a meningeal apoplexy—before the paroxysm she answered, although slowly and with difficulty, to the questions which were asked. Number of inspirations a minute, 14—number of pulsations, 72.

At seven minutes after five the paroxysm began—perplexity in motions of the tongue—speech became more difficult—it ceased entirely at twenty-two minutes after five. Inspirations 14—pulsations 19.

Then she again distinguished objects, understood without being able to answer, although she attempted, and the motions of her lips were perceived, but not those of her tongue. A quarter before six the patient closed her eyes—when slightly stirred, she opened her eyes and saw. Inspirations 12—pulsations 80.

At six o'clock the eyes were closed—it required a strong excitement to make her open them, and the eye appeared to be but slightly sensible to the approach of light: the hearing was preserved in a much more distinct manner than the sight—she gave her hand when requested. At half past six, coma. Inspirations 11—pulsations 83.

At seven, eight and nine, P. M. inspirations 9—pulsations 86. Most profound coma. This condition lasted till half past eleven P. M. At midnight, inspirations 11—pulsations 82.

The comatose state diminished—she remained in this condition until three o'clock in the morning, making unconscious movements when strongly roused. At this period, first the hearing and then the sight perceived impressions—the inability to speak continued.

At four o'clock A. M. inspirations 13—pulsations 76. Speech restored—slow, sluggish answers—disability of the tongue—sight and hearing distinct. At six o'clock A. M. the paroxysm ceased.

We may learn from this detail, first, that the apoplectic state commences at the moment when the balance between the respiration and circulation is discontinued—second, that it increases in the ratio of the discordance between them—third, that the somnolence, the stupor and coma are the result, and their degree is exactly proportioned to the difference which exists between these two functions—fourth, we may thus follow the natural order of the suspension of the senses and speech: beginning with disability of the tongue—soon after, loss of speech—defect of communication with external objects—in the third place, diminution and loss of sight—retention of hearing—at length, cessation of hearing—beginning of somnolence, of stupor and of coma, during the time the respiration is raised to the *maximum* it can attain in the paroxysm, and the respiration descends to its minimum. This condition remains sufficiently long for both functions to stand at opposite degrees. In proportion as they tend to an equilibrium, the senses are renewed in the inverse order of their suspension: the coma ceases, the ear begins to perceive sounds—next, the eye becomes sensible to light—soon after the inability to speak disappears, as well as the difficulty of using the tongue.

Suspension of the senses, first of touch—second of sight—third of hearing—embarrassment of the tongue, loss of speech before the senses are suspended, stupor, somnolence, coma, slowness of respiration, activity of the circulation, are the form and succession of the apoplectic condition.

(*e*) A very important remark and applicable to all meningeal apoplexies, is, that the respiration is always equal

on both sides—that is to say, the thorax is equally dilated on the right and left sides—the inspiratory powers remaining in perfect equilibrium. This is not the case in cerebral apoplexies.

(*f*) The same character is presented by motion: the mouth is not distorted in consequence—the body lies in a straight line, not being turned to either side. If the patient is not in a state of stupor, he offers both hands—if he is in a somnolent condition, which prevents these voluntary actions, by irritating the limbs we produce the same motions. The nervous and muscular system have then preserved their action on both sides alike. These last signs may be regarded as negative—but as has hitherto been remarked, they are of the highest importance.

(*g*) Meningeal apoplexies present very important varieties relative to the nature of the fluid effused—but I must declare, that notwithstanding my attempts to follow the progress of these diseases, I have not been able to regard any particular sign as positive. There are shades in the degree of symptoms which will be better perceived in the particular histories given at the end of this general sketch. I refer particularly to that which relates to meningeal apoplexies, with arterial rupture, or aneurismal dilatation of the cerebral arteries.

(*h*) What are the varieties of meningeal apoplexies? We may deduce them from the nature of the fluid exhaled, or from the absence of all exhalation, or from the rupture of arteries or veins belonging to the circulation of the brain.

All the meningeal apoplexies which I have had occasion to observe, may be referred to the five following varieties:

1. Meningeal apoplexies without effusion.
2. Meningeal apoplexies with an effusion of simple serosity.
3. Meningeal apoplexies with sero-sanguineous effusion.
4. Meningeal apoplexy with arterial rupture or aneurismal dilatation.
5. Meningeal apoplexy with venous rupture.

(*i*) I should far exceed the limits of a memoir if I occu-

pied as much time with each of these varieties as their importance demands—instead, I shall present some striking observations, and point out the authors who have reported analogous facts. I pass to the general results furnished by the examination of bodies in each of these varieties.

Meningeal Apoplexies.

Dissections. (*k*) In meningeal apoplexies without effusion, I have found the pia mater thickened, dry, the vessels slightly distended—the dura mater thickened in many places—the arachnoides opake, covered in the ventricles with whitish granulations of an extraordinary form.

(*l*) In meningeal apoplexies with effusion of serosity, the arteries and veins of the membranes are distended: all the pia mater is covered with a network of innumerable small vessels—the arachnoides is very opake, thickened, covered in certain places with a whitish exudation, appearing especially on the principal venous trunks, on which they form a species of veil—its opacity and thickness are much more considerable at the base of the brain, the part covering the pineal gland, and in the ventricles. I shall observe on this occasion, that the arachnoides of the ventricles is frequently altered in different degrees at the parts which cover the lobes. It should be added, that I have never met with the miliary granulations before mentioned, except in the ventricles. The degree to which the arachnoides may be thickened is far greater than has hitherto been imagined—I have often raised all that portion which covers the ventricles in separating it from the cerebral substance.

The choroid plexus is almost always injured in this variety—distended, presenting transparent cysts formed by a thin pellicle, in which I have found two distinct lamina, an external and an internal. These cysts are filled with a transparent liquid, sometimes of an orange colour, slightly salt—at other times it is sanguineous or sero-sanguineous. More rarely, I have found in the interior a clot of blood. These cysts often exist on both sides—again, only on one. I have seen two real hydatids within them. The sizes of

these cysts are very various—the largest met with were of the size of a small musket ball.

(*m*) In meningeal apoplexies with sanguineous effusion, the alteration is nearly analogous to the preceding variety—but the arachnoides is manifestly inflamed and red—sometimes I have seen with the microscope, extremely delicate capillaries which furrowed it—most commonly the whole of this tissue is equally reddish, without very distinct vessels. It is principally in the lateral ventricles that this irritation is remarked. I have nevertheless found the hemispheric part inflamed, especially in apoplexies after falls or blows on the head : then the irritation occupied the points corresponding to the portion of the head that had been struck.

(*n*) In meningeal apoplexies with rupture of the arteries, all the arteries are immediately distended—a section or rupture is found on one of the trunks, or one of the branches—that is, a laceration whose edges are unequal. Sometimes the section is complete—at others the extremities are retained by a slight slip—more rarely one of the points of the artery is aneurismal, and the sac is torn as in other aneurisms. I have observed an aneurism of the internal carotid with laceration, while yet the vessel was in the cavernous sinus. Lately I presented to the Philomathic Society an aneurism of the basilar artery supervening on meningeal apoplexy—I have also seen a similar dilatation of the communicating artery, of the circla of Willis. The hemorrhage ensuing in these cases is often mortal—the blood is in clots extended through the brain, always following the course of the membranes and penetrating the ventricles along with them.

(*o*) Ruptures of the veins are still more common than those of the arteries. Whenever we find between the membranes and the ventricles coagulated blood, and the cerebral substance remains uninjured, we may be assured that the hemorrhage has been caused by an arterial or venous rupture. I have always been able in the numerous cases I have examined, to find by a careful dissection the artery or vein, whose rupture produced the hemorrhage.

Venous ruptures frequently occur in the choroid plexus: the effusion is sometimes confined to one of them—the blood is contained in a slight cyst, or between the layers of the pia mater. A year since I presented a remarkable case to the Medical Society of Emulation. How do these arterial and venous ruptures take place? We shall examine this question elsewhere.

SECTION V.

Meningeal Apoplexies without Effusion.

SIXTEENTH OBSERVATION.

Jane Cascard, aged sixty-seven, of a feeble constitution, of a nervous and very irritable temperament, suffered a tedious disease which reduced her very much. On the 9th of February 1813, she became comatose, after three or four days' indisposition. The face was much changed—the skin was rather cold—the respiration slow—the pulse very frequent and small—she could not answer when I saw her—the senses appeared to be equally suspended—being strongly excited, she moved both arms and legs. In the evening there was a slight remission. In the morning she seemed to sleep profoundly. The discordance between the pulse and respiration could alone prove the existence of the apoplectic condition—excitants and revulsives produced no effects. On the fourth day the coma was much more considerable—there was during the day a marked inequality in the pulse. She died on the night of the third or fourth day from the attack.

Dissection.—On exposing the brain and spinal marrow, no effusion was seen between the meninges. The pia mater seemed dried, as if it had been exposed some time to the air. Its vessels were slightly distended. The arachnoides was slightly opake—within the ventricles it exhibited a dryness which surprised the pupils, accustomed to see them moistened by the serosity habitually contained in these cavities—the brain was very little harder than it usually is at that age.

SEVENTEENTH OBSERVATION.

A child of six years of age, slept with the head uncovered in the sun, April 1813. In the evening it had many convulsions, and during the night and day following. On the second night it fell into a state of profound somnolence, which was supposed to be sleep—this condition lasted the following day and night. I was called on the fourth day. The face was flushed—the eyelids were equally dilated—the respiration slow—the pulse extremely frequent—the senses entirely suspended, but the motions free when irritation was employed. Blood-letting and the application of leeches to the neck, produced such a remission as caused the nurse to hasten to feed it. A quarter of an hour afterwards it vomited—the vomiting continued until the evening, wnen the coma reappeared, with a sort of convulsive grinding of the teeth. On the sixth day of the disease, stertorous respiration, extremely frequent pulse, and profound coma took place—death followed on the seventh night.

Dissection.—The vessels of the pia mater were injected—the arachnoid of the lobes slightly opake—miliary granulations on that which covered the lateral ventricles—the capillaries of the brain were injected: no fluid was exhaled in the interval of the duplicatures, nor in the ventricles, which were nevertheless moistened. There were no worms in the intestinal canal.

EIGHTEENTH OBSERVATION.

John Pinson, aged sixty-six, was brought to the Hôtel Dieu in a state of apoplexy, which lasted during two days, and with which he had been stricken in leaving the tavern. His extremities were cold—the respiration very slow—the pulse very small but very frequent—he was in a state of stupor, from which it was very difficult to raise him, and as soon as the irritation was suspended it returned—he mechanically retracted his limbs when they were extended. He died the night subsequent to his admission to the hospital. There was no effusion in the convolutions, and none in the ventricles—but the pia mater was fully injected, its

capillaries well marked—the arachnoides covered with a slight exudation, which on the great venous trunks formed a very thin opake pellicle. Within the ventricles this membrane was rosaceous—the plexus were themselves very red, and so dry as to have a peculiar appearance.

Morgagni observed a similar case in a woman: the ventricles were dry, although the vessels and plexus were injected.

I have often observed meningeal apoplexy without effusion in epileptics, whose brain had acquired a remarkable hardness, and who had always fallen victims to a comatose state, that manifested itself many days before death.

To this variety may be referred the history of the woman related by Morgagni, and the ensuing one also. It appears that to enable him to explain these facts, and some similar ones, Morgagni imagined the acrimonies heretofore referred to. Varioli, one of the medico-anatomists who was best acquainted with the brain, had also observed it, as well as the physicians of Breslau, Guarin, Tissot, Casimir Medicus, &c. I have already stated their opinions on this subject—they are of importance as given by these authors on account of the analogy of views, with a part of those I have advanced in this memoir.

SECTION VI.

Meningeal Apoplexies with Effusion of Serosity.

Meningeal apoplexies with effusion of serosity are the most frequent—they are in proportion to the other varieties as seven to two. Their attack is often very slow—they follow in the train of tedious recoveries after general exhaustion, or the suppression of evacuations. I have frequently observed it also in leuco-phlegmatics.

FIFTEENTH OBSERVATION.

Madame D——, aged forty-nine, of a feeble constitution, ceased to menstruate at forty-three years of age, and had after that time languishing health. She wore an issue in

both arms for two years, on account of an asthmatic affection—the issues had been suppressed for five months, when she had a slight attack of apoplexy in the month of December, 1815, but without loss of motion.

In the month of November, the year following, she experienced much more distress—was fatigued by the slightest motion—suffered from an indolence which was unnatural, and a torpor of all her senses and intellectual faculties—want of sleep, and a permanent derangement of the digestive organs.

On the evening of the 24th, she retired as usual: the next morning, her daughter not finding her down stairs, went to her chamber, and found her in bed, plunged in a profound stupor, and in consequence neither understanding nor answering the questions which were asked. She returned to her senses about three o'clock P. M. and in the evening fell again into the same condition. There were the same symptoms on the day following. When she returned to her recollection she had recovered the use of her limbs, as she sat up while her bed was made.

On the fourth day, when she was received into my division of the Hospital of Pity, she was in the following condition:

Face discoloured and slightly swelled—muscles relaxed—position in bed straight—respiration slow, (12 inspirations a minute)—pulse frequent, not full, (80, 81, 83 pulsations a minute)—somnolence without stupor, as the slightest irritation caused her to move her limbs—voice lost—sight and hearing suspended—heat little increased, and no way proportioned to the state of the pulse.

I directed eighteen leeches to be applied to the neck, and below them four cups. An hour and a half after the application, and the effects of a purgative clyster, she became sensible—the slowness of respiration diminished (16, 17 a minute)—the pulse became fuller, and less frequent (76, 73, and 75)—she said nothing, but understood and made signs that she knew her daughter, who was near her—she extended her hand and moved her legs.

In the evening, the paroxysm reproduced the condition in which I had first seen her. I gave her a foot bath, strongly *sinapized*—made frictions on the chest to facilitate respiration, which in fact became more frequent, and developed a sufficient degree of heat—a second purgative clyster produced two very full evacuations.

On the following day (28th of November) she spoke—her face was always discoloured—the respiration at 18—the pulse at 74 in a minute—she might be considered convalescent: the paroxysm was slight. On the morning of the 29th she had become evidently better.

In the evening of the 29th she suffered a new attack, caused, I think, by a sudden change in the atmosphere, and I should also say by a bad position in bed.*

On the morning of the 31st, her situation appeared desperate—the face was ghastly—the nose was thin, the lateral cartilages contracted and scarcely moving during inspiration—her skin was cold and clammy on the head, chest, and abdomen. The respiration was stertorous, short, and very slow, (13, 12, 11,) interrupted at intervals—the pulse was small, extremely frequent, (89, 92, 98,) the artery seeming sometimes to disappear under the finger—profound coma. She died at three o'clock P. M.

Dissection twenty-six hours after death.—Face livid violaceous—external jugular veins turgid—ecchymoses on the posterior part of the trunk, produced by the position of the body. There was a strong adherence of the dura mater to the internal plates of the skull—exudation of venous blood from the *diploic* veins. The sinuses were considerably dilated, containing black, coagulated, slightly fibrous blood—lateral sinuses distended.

The pia mater was thickened as if bloated—arteries and venous trunks of this membrane considerably dilated—

* The position of apoplectic patients in bed, during the treatment or convalescence, is of high importance. It is by no means a matter of indifference whether the patient lies horizontally, or is raised to a sitting posture. My first care is to place such patients in the last mentioned position, having always seen the most fatal results from the horizontal.

fibrous concretions within them—the capillary veins and arteries of the pia mater were injected—in some places they were so minute as to be scarcely visible with the eye alone —the arachnoides on the lobes and bases of the brain was opake, slightly manifest in the ventricles—whitish exudation on its internal surface, distributed in small flakes at different distances—the pia mater slightly thickened.

There was an effusion of simple serosity in the cerebral convolutions, at the base of the brain and the spinal canal—second, distension of the ventricles by the fluid, first in the lateral ventricles, and also in the third and fourth, the whole making about a pound.

The serosity was yellowish, slightly salt, and very clear within the ventricles, somewhat turbid in the convolutions of the lobes, slightly greenish in the part corresponding to the injection of the last capillaries of the membrane—acted on by heat, it precipitated whitish flocks, resembling in appearance the *cloud* of urine—the brain was injected in its cortical, but not in the medullary substance.

There was nothing peculiar in the chest or abdomen.

The examples of this variety of apoplexy are very numerous in the books—a great number may be found in the Fourth Epistle of Morgagni, under the title of *Serous* Apoplexies—and in all the writers who admit this last division. I shall transcribe four of them, regretting my inability to introduce the reflections that precede or accompany them.

SIXTEENTH OBSERVATION.

" A slender man, forty years old, sick of intermittent fever, during the night of the ninth day lost his speech. When spoken to, he gave no sign of intelligence—sensation and motion remained in his limbs—the face was not red. He died on the thirteenth day. The brain was sound, except that between the membranes and it there was serum, and the ventricles were filled with the same."

SEVENTEENTH OBSERVATION.

" Another man aged sixty, of a yellow complexion, had a long time suffered under ulcers of the legs. The ulcers

were entirely dried up—he was taken with loss of speech, hebetude, and torpor of his limbs, and died the following day. Serum was found between the membranes, in the vertebral canal and in the ventricles."

EIGHTEENTH OBSERVATION.

"A man of sixty years, affected with apoplexy without palsy, died the fourteenth day of the disease. The substance of the brain was found somewhat softened—a great quantity of serosity was extravasated between the pia mater and the convolutions of the brain in all the ventricles, and at the basis of the skull."

NINETEENTH OBSERVATION.

"A woman aged thirty, who died in an apoplectic paroxysm without palsy, shewed on dissection a great quantity of serosity in the ventricles, and at the base of the skull."

SECTION VII.

Meningeal Apoplexies with Sanguineous Effusion.

An ecclesiastic, sixty years old, stout and middle sized, had during the course of his life several menaces of apoplexy, without ever having really suffered it—several times while preaching, he experienced absence of mind, and dizziness of head, which forced him to delay for some instants. In his youth he had been subject to frequent nasal hemorrhages—at thirty-two years of age, they were replaced by a hemorrhoidal flux, which disappeared at fifty, the period to which the patient referred the beginning of the accidents mentioned above.

About the end of 1813, he experienced some great distresses—and from time to time, a vague pain in the head, indigestions, and a perceptible diminution of his strength.

On the 7th of January, 1814, after having been long exposed to the air without having his head covered, he lay down, complaining of a dull pain in his head, and a state

of intoxication he had never before experienced. In the morning he was found in the following condition: the face colourless—the respiration slow, interrupted and short—the pulse very frequent, and at the same time very small: in certain moments the respiration was entirely suspended, and what is rarely observed, the face lost nothing of its paleness. Sinapisms and leeches to the jugulars were without any effect. In the evening the face, nose, superior and inferior extremities, were chilled—the respiration was continually stertorous—the pulse was so small and frequent as scarcely to allow of its being counted. From the beginning of the attack he had remained in a state of stupor, from which nothing could arouse him. He died at half past eight in the evening.

Dissection twenty-eight hours after death.—Face coloured violet, principally on the right side, the patient having laid on this side.

The scalp being raised, small drops of blood were seen coming from the venous canals of the skullcap. The bones being cut, and the dura mater opened, a sanguineous fluid escaped which had been interposed between the dura mater and tunica arachnoides: the blood was fluid and without clots—exposed to the air, and at rest, it did not coagulate: what was first discharged was about eight ounces. When the ventricles were opened, about five ounces of the same fluid, but of a deeper red colour, were obtained: no coagulation took place in this after exposure to the air, at rest.

The pia mater was very red, an appearance that seemed owing to the arachnoides—the vessels were very much dilated, which added greatly to its thickness. The plexus were swelled, having vesicles scattered ever them with cysts of the size of a grape seed. They were filled with a reddish fluid. On the hemispheres the arachnoides was injected—in certain places it was identified with the pia mater: on the base of the brain it was reddish and violaceous, where its alteration was most perceptible. In the ventricles, but especially in the left, it was covered with considerable reddish, miliary granulations. The internal surface of the

dura mater was also coloured, but without granulations. The brain was injected: when cut through, small drops of blood flowed from the capillaries—the surface exposed to the air became shortly after very red, although it was of a whitish gray at the moment of the incision—the cerebellum and spinal marrow did not exhibit any perceptible alteration.

TWENTY-FIRST OBSERVATION.

A young slater fell from an elevation of forty feet, and the right side of his head struck violently against the ground. He raised himself up, but became insensible a few instants afterwards. His companions carried him into a tavern, where they administered wine and brandy—he was conveyed thence to the hospital in a comotose state, which seemed to require the application of the trephine: this was postponed till the evening visit. At this time he had recovered his sensibility, and the operation was not performed. On the morning of the day following, the condition of the preceding evening returned, and the necessity of applying the trephine was again perceived and deferred. In the evening, the apoplectic paroxysm having ceased, the patient saw and understood without being able to speak, although he was very ill. No operation was performed. He died the same night. Dissection now exhibited, first, an ecchymosis of large size on the right parietal bone, but without fracture—second, the pia mater and arachnoides were inflamed for three inches opposite to the external ecchymosis: there was no collection between the dura mater and other membranes, but in the depressions there were some drops of a sanguineous fluid on the right lobe alone—third, the right ventricle contained a sanguineous fluid which might be about five or six ounces—the arachnoides which covered it was very red, but without granulations—fourth, the left ventricle contained some drops of bloody fluid, without manifest alteration of the arachnoid membrane.

We find in authors many analogous facts, in which they have only forgotten to remark the condition of the mem-

branes, the extravasation being the only point they thought it important to establish. The sculptor of Padua, whose history is given by Morgagni, evidently died from this variety of meningeal apoplexy—we find, also, all the characters of the same in the following observation borrowed from Wepfer.

TWENTY-SECOND OBSERVATION.

"I. R. forty-five years of age, of a slight form, devoted to study from his early youth, was found lying on the earth insensible and speechless. Two hours afterwards he became lividly pale, his breathing alone continuing—his extremities and the nose became cold—the pulse was at first good, frequent, large, but soon became *weak, small and very frequent—the respiration more laborious, unequal, and so slow that sometimes it appeared to have entirely ceased.* I did not venture to draw blood. At ten o'clock *some motion was evident*—a mucus liquid flowed from the mouth—the strength failed more and more—the extremities grew colder, and he expired at half after one P. M.

Dissection.—On opening the cranium and cutting the dura mater, a very large quantity of blood escaped which had been contained between the dura mater and the arachnoides—this blood was not only found about the base of the brain, but also over the superior, anterior and posterior parts, and also in the depressions of the cerebrum. The lateral ventricles were entirely filled with blood, as well as the fourth ventricle—the quantity of fluid was two pounds or more."

Remarks.—I have seen cases in which there was a serous effusion on the lobes, and a bloody extravasation, with inflammation of different degrees of intensity, in the ventricles. In a man of fifty-eight years, I have found a sanguineous effusion in the left ventricle, and none at all in the right ventricle, or in the depressions—at other times I have met with many cysts in the plexus, filled with a reddish fluid, while the ventricles contained either a yellow and clear, or a turbid serosity. But a very essential re-

mark, and which I have constantly verified in the numerous bodies I have opened at the hospital, is, that the alterations of the membranes are in correspondence with the nature of the fluid effused. I should also insist on another character of the sanguineous fluid contained in the natural cavities of the brain, that it is always in a state of fluidity. Clots or fibrous concretions are never found: some experiments have led me to conclude that the fluid is the serous part of the blood charged with certain portions of the colouring matter. I have opened more than sixty bodies having similar effusions. I have never once found what is called a *clot of blood*, nor even grumous blood. In no case, however minute were the researches, has there been found a rupture in the capillaries, or in the trunks of the vessels of the pia mater, in such a manner as to allow us to believe that the effusions have been produced from the meninges.

I shall rest upon this character—and for this reason, in every case of meningeal apoplexy, wherever we find a clot of blood, whatever its situation or volume, we may decide that the blood has flowed from a ruptured artery or vein, and, by a careful dissection, the opening may be found by which the blood escaped. It is a true hemorrhage from an arterial or venous rupture, as we shall see in our subsequent observations.

(*To be continued.*)

Art. IV. *On Baths and Mineral Waters.* By John Bell, M.D.

It is impossible for me to give, in the following essay, more than the mere outline of a subject, the historical part of which would alone readily fill a volume. My leading object is to direct the attention of the profession and the public at large, to the mineral and thermal springs of the

United States, and by showing what progress has been made in their chemical analysis, and determining their medicinal properties, to incite to farther experiments and inquiries, and thereby complete what is yet wanting to an entire and accurate knowledge of them.

This task will, I apprehend, be more successfully accomplished, and lead to happier results, by a brief preliminary sketch of what has been done in other ages and countries, as regards the employment of baths, and drinking of mineral waters. I shall treat then, first, of bathing, historically and medically—second, of the composition and medicinal powers of the most celebrated mineral springs of the old world—and thirdly, of those of our own country—applying as much as possible the preceding history and remarks to an elucidation of the virtues of the last, and an encouragement to their more extensive use by the sick and infirm.

In the execution of the first part of my plan, I need not have recourse to other or better authority than that truly philosophical work of Franceschi, medical director of the baths of Lucca, and entitled "*Igèa Dei Bagni e piu particolarmente di Quelli Di Lucca*, 1815"—the translating of which served to beguile me of some weeks on a China voyage. Nor is there a publication of the kind extant better calculated to instruct and amuse the professional man, the invalid, and the general reader.

If the custom of bathing be not coeval with the world, its origin may at least date from a very early epoch. The means which it furnished of purification and invigoration, seems to have been first adopted by the inhabitants of Asia, placed as they were under a burning clime.

The people of the first ages immersed themselves most frequently in rivers or in the sea, and accordingly we are told of the daughter of Pharaoh bathing in the Nile, of Nausicaa and her companions, as also Agenor, bathing in a river, and of the Amazons refreshing themselves in the waters of Thermodon. The Greeks plunged their tender offspring into cold torrents—and Moschus and Theocritus make Europa bathe in the Anaurus, and the Spartan

girls in the Eurotas. Domestic baths, suggested by the wants or the conveniences of life, were not unknown at very early periods. Diomed and Ulysses are represented as making use of such after they had washed in the sea—Andromache prepared warm water for Hector, who had just returned from battle—and Penelope, to banish sorrow, called in the aid of unctions and baths. Minerva, at Thermopylæ, is feigned to have imparted, by such means, vigour to the wearied limbs of Hercules, and in place of other gifts, Vulcan offered him warm baths. Pindar praises the warm bathings of the nymphs—and Homer himself, who ranked baths among the innocent pleasures of life, not only makes mention of a hot and vapourous spring adjoining a cold one, but even describes to us the baths which, by common tradition, were situated near the Scamander in the vicinity of Troy.

Of nearly equal celebrity were the baths of the Assyrians, Medes and Persians—and to such a pitch of grandeur and improvement were they carried by this last people, that Alexander himself was astonished at the luxury and magnificence of those of Darius, though accustomed to the voluptuous ones of Greece and Macedon. We need here but allude to the natural warm baths of Bithynia and Mytilene, mentioned by Pliny, and to those of the Etruscans, as among the most early and extensively known and resorted to.

If next we speak for a moment of baths considered as one of the resources of medicine, to whom is it not known that the greater number of the temples consecrated to Esculapius, as those at Athens and Cenchreæ, were constructed in the vicinity of springs—that Melanthus, by means of hellebore and warm baths, restored to health the delirious daughter of Prætus—that Hippocrates recognized in mineral baths one of the most powerful remedies—that Herodotus, Archigenes, Antilles, Agathinus, and all the followers of the school of Athenæus, made use of them: and that Asclepiades, in fine, in despite of prejudice and

opposition, was enabled, by the wonderful effects which baths produced, to extend greatly their use in his time?

With the advancement of luxury, the practice of bathing was carried to such a pitch as to call for those stupendous establishments in Rome, the remains of which excite our astonishment at this day--such as the Thermæ of Agrippa, of Nero, of Vespasian, Titus, Antoninus Caracalla, Diocletian and Constantine. Some idea may be formed of the extent of the baths of Diocletian, when we know that one of the halls of this edifice forms at present the church of the Carthusians, one of the most magnificent temples in Rome. Vitruvius makes us acquainted with the construction and arrangement of the public baths, and their union with the *palestræ*, or those places in which the Greeks and Romans exercised themselves in gymnastics, as wrestling, pitching quoits, throwing the javelin, boxing, swimming, as well as in philosophical disputations and discussions on various literary subjects. The first Thermæ, indeed, constructed by Agrippa, and furnished copiously with water from the neighbouring mountains and from Tusculum, were situated, for the greater convenience of wrestlers, in the vicinity of the Campus Martius, and those of Nero, near the Circus Agonalis (now Piazza Navona)—but even these, in the sequel, were united to the palestræ, conformable to the custom of the Greeks. (*Mercur. de arte gymn.*)

The Grecian palestræ were of a rectangular form, the four sides of which were divided into various halls for the purposes above mentioned—and into other parts for the hot and cold baths distinct for the two sexes, to which were annexed the sudatory, (or *sweating bath*) and the refrigeratory, (or *cooling room*) with their appurtenances for undressing, anointing and perfuming.

Pliny informs us that public baths were not in use in Rome prior to the time of Pompey--and Dion, in his life of Augustus, attributes the erection of the first to Mæcenas. Agrippa, during the time he was Edile, increased the number to one hundred and seventy, and in the course of

two centuries there were no less than eight hundred in that metropolis. Of their vastness we may form an adequate conception, from an expression of Ammianus Marcellinus, in which he does not hesitate to compare the thermæ of the Romans to provinces, *in modum provinciarum extructa lavacra.* The pavement was sometimes of crystal, but most usually of mosaic and plaster. Painting and sculpture there exhausted their refinements, and incrustations, metals and marble, were all employed in adorning them.

The Romans generally applied the name of bath, *balneum*, to a part of their habitation in which they were accustomed to wash their body with warm or hot water—and they made use of the term baths, *balnea*, to designate public baths. The different divisions which, when united together, constituted the baths themselves, were by Cicero called *balnearia.* Among these were principally reckoned the hot bath, *calida lavatio*—the cold bath, *frigida lavatio*, or *solium frigidum*—the *frigidarium*, the *tepidarium*, the *laconicum*, called also *calidarium*, *cella calidaria*, *sudatorium*, and by Suetonius, *spheristerium*, from its round form—the *elæothesium*, the attendants in which were called alyptæ, or *unctuarii*—the *conisterium*, and lastly, the *apodyterium*, with its keeper called *cassarius.*

Among the objects relating to the baths was the *hypocaustum*, or furnace, being that part from which the fire ascended, and which was fed for the most part with balls of pitch, or other combustible matter, by means of servants called *fornacatores.* From this, according to Seneca, the heat was every where diffused through various tubes, the remains of which are to this day visible in the thermæ of Diocletian and Caracalla. The apartment destined for the vessels was called *vasarium*, and held the three recipients of cold, warm, and hot water, which on account of their great size were called miliaria, and distinguished, likewise, by the names of *frigidarium*, *tepidarium*, *calidarium.* We may also take notice here of the *strigiles*, or instruments of bone, ivory, or metal, for scraping the skin: they were of a semicircular form, rounded at the extreme edge, with a

groove, through which the impurities of the skin might run off.

The north front of the thermæ* contained a reservoir of cold water, which, when sufficiently large to admit of the exercise of swimming, was called *piscina*, and by Pliny the younger, *baptisterium:* the centre was occupied by a spacious vestibule, and on each side was a suite of warm, cold, and vapour baths, with their appendant apartments for cooling, dressing and refreshment.

The hot bath contained a vessel of marble, stone or wood, distinguished by the Latins with the name of *labrum*—it received light from the top, so that those who stood around a balustrade called *plateum*, might not shade the bathers. Behind was a kind of gallery, *schola*, the pavement of which, according to Galiani, declined toward the middle, thereby to carry off the water dripping from the body of the person who had just come out from the bath. This gallery was, it would seem, occupied by those who were waiting for their turn to descend into the bath, on the coming out of others who had preceded them.

The *frigidarium* was a vaulted room, in which they remained, who, leaving a milder medium, were afraid of a sudden passage to the open air.

The *tepidarium* was annexed to the *frigidarium*—it was also of a vaulted form, and afforded a temperature intermediate between the *frigidarium* and the hot bath, properly so called, and more frequently still, served for those who wished to pass on and make use of the vapour bath.

The *calidarium*, called also *sudatorium*, or vulgarly stove, was by many believed to imply the same thing with the *laconicum*. But it is rendered more probable by Galiani, that this last was a grating or perforated apparatus, of a cupolated form, through which the fire received from the *hypocaustum* or furnace, was transmitted into the stove

* When the hot baths or springs came to be joined to the cold ones in public establishments, these latter obtained the name of *Thermæ*, a title since restricted exclusively to warm or hot baths.

itself. Although this has generally been regarded as a dry bath, according to what may be gathered from Celsus, Galen, Seneca, and especially Martial, when he speaks to Oppian of the Etruscan baths, (Lib. vi.) yet Oribasius considered it as a true vapour bath—the vapour being conveyed in by particular tubes, which were distributed under the superior vault, and let the moisture trickle down in the form of dew. This kind of bath substituted for hot immersions, which were said by Pliny to be equivalent to scalding, was used chiefly under the false impression of its accelerating digestion, and thereby exciting a fresh appetite for food.

The room in which the body was rubbed over with unguents, took the name of *elæothesium*—it was accordingly furnished with a great number of vessels filled with ointments and essences of the most precious kind.

In the *conisterium* was preserved the powder to sprinkle over the body after the exercise of wrestling, and then rubbed off with the *strigiles*, previous to entering the bath.

Finally, the *apodyterium* was the place where the clothes were deposited, and in which the bathers undressed and dressed themselves at pleasure.

All these parts were commonly double, and "the original intention in thus constructing them was, that each wing should be appropriated to the different sexes. It was then not even thought decorous for a father to bathe with his son, after the latter had attained the age of puberty—but this reserve soon wore off, and notwithstanding various prohibitory decrees of succeeding emperors, the baths were indiscriminately used by both males and females, with this only distinction, that the latter were attended by women."*

Bathing during the night was not allowed among the ancients, and the Romans resorted to the baths only at particular hours, which were indicated by the ringing of a bell, *sonat æs thermarum*, *(Mart.)* Pliny tells us that this hap-

* See Domestic Manners and Institutions of the Romans, from page 97 to 103.

pened at eight o'clock in the morning in summer, and nine in winter. The edict of the emperor Adrian, prohibiting their being opened before eight in the morning, unless in cases of sickness, was revoked by Alexander Severus, who not only permitted them to remain open during the whole day, but even to be used through the night during the great heats of summer. It was the practice of the Romans to bathe towards evening, and particularly before supper, although the more luxurious made use of the bath even after this meal. We are told of many Romans of distinction, who were in the habit of bathing four, five, and even eight times a day.

These establishments were under the immediate superintendence of the Ediles, who besides attending to neatness and decency, regulated also the temperature of the baths. Bathing formed part of the demonstrations of public rejoicing, equally with the other spectacles, and like the latter was prohibited when the country suffered from any calamity. The baths of the Greeks and Romans, different in this respect from those of the Carthaginians, were not only common to all classes, but even the emperors, such as Titus, Adrian, Alexander Severus, and at a later period, Charlemagne, after having vied with each other in erecting public baths for general utility, condescended at times to bathe with the people, thereby winning over their naturally untractable and ferocious dispositions.

After the example of the Romans, the other people of the provinces, as the Gauls, the Germans, the Persians, and the Britons, were extravagantly attached to this kind of establishments. But neither the Greeks who preceded, nor any others who endeavoured to imitate the Romans, ever carried into them that exquisite taste and magnificence which were displayed in the baths of these latter.

Were my intention merely to gratify curiosity, I should not enter into any detail of the baths or modes of bathing in use among the moderns: but as an account of this nature has a bearing both on physiology and therapeutics, I shall stand excused for here repeating what is found in

different books of travels. Those nations, the modes of bathing among which demand our more particular attention, are the Russians, the Finlanders, the Egyptians, the Turks, and the inhabitants of the East Indies.

The Russian baths are for the most part constructed of wood. The room destined for the purpose has a flue, the fire of which not only heats the place itself, but serves to ignite some large stones over the flue. In this apartment is a boiler of hot water, around which are ranges of steps from the floor to the roof, on which the bathers sit entirely naked, each one choosing his seat according to the degree of heat he prefers, which is in proportion to the ascent of the steps. Pipes are fixed in different parts of the room, conveying hot water, which is occasionally thrown over the heated bricks, and together with the vapour from the receiver, rises up in the form of hot steam. After the expiration of a quarter or even half an hour, when the body is yet bathed in sweat, each bather washes himself with soap and water, and switches his body with a bunch of the soft twigs of the birch tree, and finally uses affusions of cold water, some buckets full of which are poured on his head. The people going out from the bath sometimes throw themselves into the nearest stream of water, or roll in the snow, after which they are exposed anew to the vapour bath. This process being terminated, they have recourse to some vinous or spiritous drink, or warm beer containing mint and spices. They are thus disposed to sleep, and said to be subsequently capable of enduring the greatest fatigue.

The ordinary heat of a Russian bath is from 40 to 45 degrees of Reaumur (122 to 133 degrees of Fahrenheit.)

The being thus accustomed to pass from so exalted a temperature to one so many degrees below the freezing point, imparts to this people an extraordinary vigour, one may almost say, bluntness of physical power. The bath is regarded as a sovereign remedy for all their diseases and complaints, particularly indigestion. Its use may, indeed, be considered as a part of their religion, since after having bathed, they are viewed as absolved from their sins.

The Russians practice bathing in winter and summer, in all ages and situations of life, in pregnancy, on their return from a journey, and after any fatiguing exertions.

The Finlanders make use almost entirely of vapour baths dry and moist. In the first or dry sudatory, the thermometer of Fahrenheit is from 140° to 167° (40° to 60° of Reaumur)—in the second, or moist sudatory, the heat does not exceed 122° of Fahrenheit (40° Reaumur.) The vapour in this last is pungent, and offends the eyes—flame is extinguished, and animals suffer very much, and even perish in it—men become vertiginous, and almost in a state of stupor—their animal heat augments one or two degrees, and the pulse in an adult gives 115, and even 125 beats in a minute—and is, in a child of ten years old, increased to 160—infants when in it appear almost dead, and yet there are some exposed twice a day to such a punishment. This is perhaps the reason why there are so many deaths in early life in Finland.

These baths commonly produce a febrile action, easily recognised by the redness of the skin, heat, and burning thirst, extreme debility, difficult respiration, stupor in some, and obstinate wakefulness in others. The perspiration being thus augmented, all the other secretions are diminished, especially milk and urine. The senses become deadened, and the flesh is in general more flabby than common. In this state of things, perspiration after a while ceases, nor could it be renewed if the heat were augmented to 144° of Fahrenheit.

The dry bath, from 140° to 144° of Fahrenheit, is more supportable than a moist vapour bath of 117° to 122° of Fahrenheit. The Finlanders were formerly in the practice of rolling themselves in the snow, but at present the custom is almost universally abandoned. In Carelia, Tevastia, Savolax, it is customary to bathe every day—in Nieland less frequently.

The Egyptians, says Savary, (Letters on Egypt,) are in a measure necessitated to avail themselves of baths, on account of their climate, in which they perspire a great deal,

and hence it becomes indispensable to keep the skin clean by artificial means. In fact, there is not a city in Egypt which is unprovided with both public and private baths.

The apartment first presented to our notice is an extensive hall, in the form of a rotunda, open at the top, so as to admit a free circulation of air. Within is observed a passage, covered with carpeting, to which correspond several small recesses for depositing the clothes. In the middle of the edifice is a fountain of water, serving to ornament the hall. The clothes being taken off, a napkin is wrapped round the body, sandals are put on, and the bather enters a narrow passage, where a sense of heat is begun to be felt. The door of entrance is now closed, and on advancing twenty steps farther, a second opens into another passage at right angles to the first. Here the heat is greatly increased, so that those who are afraid of a higher degree of it, stop a short time in a marble hall, which is erected just before the bath, properly so called. This last is a spacious room, of a vaulted form, the floor of which, equally with the walls that enclose it, are incrusted with marble: in this are four small rooms, or cabinets, the use of which will shortly be learned. In this apartment the vapours that arise without ceasing from a fountain and a vessel of boiling water, uniting with the perfumes that are burnt at the same time, produce sensations of the most delightful nature.

Those who take the bath, lie down on a carpet or cloth, reclining the head on a small pillow, and choosing that posture which is most agreeable. After having reposed thus for some time, and the skin becoming moist with sweat, the bather is pulled about, in various ways, by an attendant, who gently rubs the flesh, and moves with quickness all the articulations, now more yielding and flexible. This friction of the skin is performed for some time with a woollen glove, and all the impurities being thus removed from the surface of the body, the same attendant leads the way into one of the above mentioned cabinets, where he pours on the head a lather of scented soap, and then withdraws for some time. The Egyptian cabinet, the last place to

which the bather is conducted, contains a vessel with two spouts, the one for hot, the other for cold water. Here he washes himself alone, and a little while after receives from the servant a pomatum, (*rusma*,) which takes off in an instant the skin of the parts to which it is applied. This operation finished, and the skin cleansed of every impurity, he covers himself with warm clothing, and passing through various corridors, finally arrives at the outer apartment, so that by this gradual passage from heat to cold, no prejudicial effects are experienced. A person who has any fears on this score, is accustomed to remain some time in a hall contiguous to the sudatory already described, in which is a bed for the repose of the bather. A youth now enters, and exercises gentle friction on every part, so as to make it perfectly dry, and in order that fresh linen may be substituted for that which was wet: the callosities of the feet are gradually removed by a piece of pumice stone, and the whole concludes with the presentation of a pipe and Mocha coffee.

The women are passionately fond of these baths, and make use of them at least twice a week. More voluptuous than the men, they wash the head and the rest of the body with rose water, anoint and plait their black hair, darken their eye lashes, and give to the nails of their hands and feet a roseate colour, by means of the juice of a shrub indigenous to those climes (*henné*)—and finally their clothes are perfumed with the grateful odour of the aloë wood. The Egyptians are magnificently dressed on the days in which they visit the baths, and pass, as it were, through a cloud of perfumes. These refinements of luxury, which may well excite so much surprise in our days, were certainly not unknown to the ancients. Homer relates that Pisistratus and Telemachus were treated with no less effeminacy at the court of Menelaus. These travellers, after having admired the beauty of the female slaves, were conducted by them to a marble bath, where they were washed by the hands of the latter, who afterwards sprinkled over their bodies odoriferous essences, clothed them with the

finest tunics, and not less costly furs—after which, to complete this round of pleasure, the strangers were invited to a splendid banquet. (Odyss. IV.)

In the brief sketch which follows of the Turkish baths, we are indebted, says Franceschi, to the dissertation on the Oriental baths by Signor Timoni, physician at Constantinople.

It is known, says this writer, that every Turk is required by the laws of Mahomet to wash his face, neck, hands and arms before each prayer—now as their prayers are repeated five times daily, they are bound to perform their ablutions as often. Besides these ordinary lavations, there are others peculiar to each sex. In the pilgrimage to Mecca, when they cannot well procure water in the deserts of Arabia, they rub the parts above mentioned with sand.

The Turks make use of limpid water only, nor is there a nation in the world more attentive to preserving their bodies accurately clean—they wash themselves on getting out of bed, and also through the day, whenever it is required. Every Turk who possesses the means has baths in the interior of his dwelling, and these constructed with the greatest luxury.

The Turkish baths are of stone, and arranged in such a manner, that cold as well as hot water may be poured into their basins—they receive light from the top, and some tubes that pierce the walls serve to give exit to the smoke and heat of the sudatory. Adjoining the baths is a cistern of cold water, and lower down a copper boiler, situated over a furnace, the heat of which is diffused under the floors of the bathing rooms. The fire burns night and day in the public baths. Adjoining them is a place where the clothes are deposited, and in their stead a napkin of silk, or of blue or white cotton is taken, which extends from the breast to the feet—wooden sandals are also put on, as well to prevent their feet from being soiled, as because the great heat of the floor would be otherwise insupportable. The bathing lasts half an hour in winter, and a quarter of an hour in summer, after which the body is rubbed with a piece of

camlet, and scoured with soap united to an argillaceous earth. In the Turkish provinces there is not a village without a public bath.

Nothing can be more sumptuous than their private ones, in which luxury truly Asiatic, appears to exhaust all its splendour. The rooms are lined with the finest marble—the basins are supported by columns with gilded capitals—all the vessels are of gold or silver—the linen is of the finest kind, and the sandals even are studded with pearls, emeralds and diamonds. While the bath lasts, they amuse themselves in looking at the fountains in their gardens, the windows opening to which, are of a single piece of crystal—on coming out they have coffee, or some other grateful beverage brought to them. The Greeks, Armenians and Jews, though not in the habit of bathing so frequently as the Turks, are not backward in displaying great luxury in their baths.

To Signor Anquetil we stand indebted for the description of the baths of the Hindoos, such as he saw them at Surat.

In these climes, bathing is not performed by immersion in water, as is practised in Europe. The bath consists of three halls of a vaulted form, and admitting light from above by means of a circular window. The clothes being taken off in the first, the person passes into the second—in the third the water is almost boiling, and the heat so excessive that one can hardly walk on the floor. Immediately on entering one of these two last mentioned halls, an attendant extends the bather on an estrade, pours warm water over his body, kneads with wonderful dexterity every part, and makes the articulations of the fingers and other parts crack—he then turns him on his face, kneels on the loins, takes hold of the shoulders and moves all the articulations of the back—he next gives strong slaps to the muscular parts, and arming himself finally with a hair glove, rubs the skin with such force, that he himself falls into a perspiration. He next destroys the callosities of the feet with pumice stone, anoints the surface with soap and odoriferous essences, and concludes the whole by shaving and dressing

the hair.* These manœuvres last for at least three quarters of an hour, after which the subject of them reposes on a sofa, tranquilly smoking for some time. All this produces in the Hindoos a sensation of delight unknown, say they, to the inhabitants of other countries. We are informed by Anquetel, that a Bramin must perform his ablutions at least three times a day.

The women are passionately fond of their baths, and pass a great part of the day extended on a sofa, and surrounded by slaves who rub their legs, and sometimes their whole body, so as to produce the most delightful sensations.

Having treated of bathing in a historical point of view, I have next to consider *the different kinds of baths, and their general action on the living system.*

Baths have been divided into common, marine, and mineral, according as common water, sea water, and natural or artificial mineral water was used: and among those prepared by art, we distinguish the astringent, the corroborant, the emollient, &c. according as the water is impregnated with substances that are known to possess any of these properties—so that baths may act on the system either in virtue of their caloric, or again topically by means of the chemical substances held in solution.

In the times of Galen and Ætius, baths of water and oil were made use of (*hydrolœum*)—those of milk, and especially of asses, were highly esteemed by the ancients, and we are told that Poppea, in order to preserve the fairness of her skin, had four hundred of those animals constantly with her, *propter quod secum comites educit asellas,* (Juven.)—nor is it unusual to find recommended baths of must, wine, or vinegar, which last is highly praised by Pliny, for the happy cure obtained by M. Agrippa when cruelly tormented by pains in his feet. What horror must we not feel at what is related by the same Pliny, of the baths of human blood used by the kings of Egypt to cure them-

* The practice of the Chinese is very similar to the foregoing.

selves of elephantiasis, if indeed such an account did not, from its strangeness, seem to be fabulous.*

The body, when charged with electric matter, may be said to be in an electric bath—and enjoying the aeriation of Franklin, in an air bath. Baths of clay, sand or mould, anciently in use amongst the Egyptians, and praised by Pliny, were obtained every time the whole, or a part of the body, was covered with any of these substances.

Baths are general or partial, and these last assume the name of semicupium if only half the body be immersed—of pediluvium if the feet alone, and maniluvium if restricted to the hands. To this last class we may refer fomentations, which are nothing more than a simple vapour bath determined to any part of the body by means of a sponge, or any other substance calculated to imbibe and retain for some time that fluid, the application of which has been prescribed.

But all these divisions are far from leading us to that philosophical precision which so important a subject demands, and without which all our reasoning will be vacillating and uncertain. Now, as the fluids used for our purposes may be endowed with different degrees of temperature, whence their effects greatly vary, so it is necessary to have them classed, according to their various degrees of heat, rather than from any other property.

The sensations of heat and cold, are, it is true, in a measure relative to the situation of the individual, and to the different states of the atmosphere, but there is a certain point beyond which they cease to become so, under any circumstances whatever. This state, which might almost be called one of invariability of temperature, may be fixed according to Macard, at the standard of animal heat, equal to 98° Fahrenheit, (29° R.) We are assured from a variety

* A similar story is told of that compound of cruelty and effeminacy, Louis XV. of France, who, were he to be sketched by the hand of a Tacitus or a Suetonius, would figure as the rival of Caligula or Heliogabalus.

of experiments and observations, that the animal heat does not suffer any notable change, whether under the scorching rays of a tropical sun, or amid the eternal snows of the pole—in a febrile chill, or in the height of the paroxysm. We may, then, with safety conclude, that there exists in every individual a degree of positive heat, and that a bath above this grade, or animal heat, produces effects entirely different from one of a less temperature. This is consequently the true point of separation, and the basis on which we may with propriety found a suitable division of baths.

Setting out on this principle, I shall adopt as decidedly preferable to all others, the arragement of Marcard, as improved and modified by Franceschi.

Baths, then, in our view of the subject, are divided into *cold*, *cool*, *warm*, and *hot*. The first, or *cold*, includes those from the point of congelation to 66° of Fahrenheit (15° R.)—the *cool*, those from 66° to 84° F. (15° to 23° R.)—the *warm*, from 84° to 98° F. (23° to 29° R.)—the *hot*, those baths, the temperature of which extends from the last point to that degree of heat which can be tolerated but for a short time.

Having premised thus much, we can now with more certainty and safety advance to an examination of the effects produced by baths on the human body. The skin, the extent of which has been estimated at about fifteen square feet, is that part on which baths more immediately exert their influence. This tissue is full of nerves and vessels, the latter of which are in part absorbent, and partly secretory, or separators of insensible perspiration and sweat, and likewise of various gaseous substances, and belong directly to the arterial or irrigating system. Sanctorius, Dodart, and Keill have endeavoured to show, that perspiration is the most considerable of all the evacuations from the body, for, according to them, it is to all the others in the proportion of fifteen to twelve. We may doubt, however, very much, the accuracy of these calculations, as no estimate was taken of what is emitted in respiration, or of how much is imbibed by the lymphatics of the surface, both of which

would very much invalidate the truth of their estimates. It has been a current opinion, that the water of even a warm bath would impede the exit of perspirable matter, but Keill, Cruikshank, Home, and Lemonier, have proved beyond a doubt that this is precisely the means best adapted to favour it.

Of the share which the lymphatics of the skin have in the effects that baths exert on our systems, physiologists and experimenters are not so well agreed. Some have gone so far as to deny entirely cutaneous absorption—but we think the position of those most tenable, who would restrict the performance of this function to particular parts of the surface, and consider it as very slow, if not entirely null in others.

But what most imports us to know is the prerogative enjoyed by the nerves, which communicate with every part of the body, and hence transmit sensations, of whatever nature they may be, to the various organs of the body—keeping up a harmony in all the functions, and not unfrequently propagating diseased actions from one part, to another very remote one in the system.

This physiologico-pathological law, laid so much stress on by John Hunter, and since amplified and extended in its bearings by Darwin, Chapman, Broussais, &c. explains to us, in some measure, the effects which medical substances produce on the most distant parts of the living frame.

Let us now proceed to inquire into the effects of baths of different temperatures on the two most remarkable functions of the human body, viz. circulation and respiration.

The question as to the sedative or stimulating powers of the cold bath may be postponed, until we give the observations and results of the experiments of those who have made the subject of immersion in water one of particular inquiry. We need not lay much stress on what Galen has written, *De Mutatione Pulsuum ex Balneis calidis et frigidis*—or Avicenna, with his numerous commentators—but shall refer more immediately to Poitevin, Marcard, Haygarth,

Parr, and above all the very accurate Marcard—besides the little that has been said by Athill on cold baths.

Poitevin informs us that in a bath of 98° F. (29° R.) the pulse did not undergo any change—that its beats were more frequent if the heat was increased—and that when the bath was of a temperature less than that of the body, the pulsations were diminished nearly in the same proportion in which they had been augmented in the hot bath. The experiments of Marcard, though not performed with the greatest accuracy, tend nevertheless to prove the quickened circulation in a bath above animal heat, and its diminished frequency in one below it. Those of Parr, inserted in the Edinburgh Essays, have the same tendency, as also those of Haygarth, published by Falconer in his work on mineral waters. But without losing time, and wearying the patience of our readers by useless discussion, we shall content ourselves with simply repeating the results obtained by Marcard, because they are the offspring of that accuracy which distinguishes so able an observer. The following are the conclusions from his numerous experiments.

Every bath below 98° F. (29° R. or near 37° Centigrade,) diminishes the frequency of the pulse, whenever some particular cause is not opposed to this effect: The more removed the pulse is by its frequency from a healthy standard, the greater is its retardation in such a bath. The temperature that seems to possess to the greatest extent the power of lessening the number of pulsations, is that from 84° to 98° F. (23° to 29° R.) It must, however, be remembered, that our author has not constituted minute experiments upon the cool and cold baths. Athill says, that in a bath of 52° F. (9° R.) the pulsations descend from 76 to 60. Currie observes, that in sea baths the pulse becomes slower, although according to Buchan, it was accelerated in the first moments of immersion. Nor ought we here to omit mentioning, that however much the pulse may be retarded in its beats in a bath below animal heat, yet this diminution is not always uniform, even in the same individual, much

less in different subjects, as has been erroneously asserted by Poitevin. Marcard relates the case of a person in whom he did not observe the slightest change in the arterial action, though the immersion was performed under the most desperate circumstances.

The point next to be considered is the influence which the bath exerts over the very interesting function of respiration, which we know to be so closely allied to the circulation of the blood, (*Sanctorius*, *Boerhaave*, *Haller*, *Floyer.*) It has been already remarked, that the pulse is sensibly diminished in frequency, after the first moments of immersion in a bath below animal heat. Now agreeably to this fact, we might readily conclude, that the respiration ought to be retarded together with the circulation—and although we cannot examine this phenomenon with strict mathematical exactness, enough has been determined to prove the impossibility of baths of a temperature below the degree indicated above, acting in any manner different from that of all other powers abstracting stimulus, or *counterstimulants.** In fact, though in the cold bath respiration may for a minute appear to be hurried, (Buchan) yet so great is the abstraction of caloric from the surface, that the circulation cannot in any measure be accelerated, nor can, consequently, any excessive excitement be induced in the system by these baths. How, indeed, can a bath of a temperature equal to or below that of our body, heat or excite it? The fact cited in opposition to this position, of the human body being greatly heated in an atmosphere of 98° F. and the deduction that it ought to be still more so in water which is a fluid of greater density, is not possessed of any weight. No one could pass seven minutes together in a bath of 207° F. yet Solander has remained an equal time in air heated to this point without experiencing any great inconvenience. We are then justified in concluding, first, that atmospheric air being less dense than water, which has eight hundred times

* For the meaning attached to this word by the Italian physicians of the day, and an exposition of the doctrine of *counterstimulus* generally, see the fifth number of this Journal for November 1821.

the density of the former, may be borne at an exalted temperature, when the lungs are permitted to emit their caloric—second, that the greater density of water compared to atmospheric air, in rendering it more adapted to the introduction of a greater quantity of caloric into the body immersed in it, cannot be borne by this body when the temperature of the bath greatly exceeds animal heat. Hence, then, as neither the sanguineous circulation nor the movements of respiration are accelerated in a bath below animal heat, every difficulty is removed respecting the counter-stimulant or sedative nature of this remedy.

Of Cool and Cold Baths, and Sea Bathing.

It has already been premised, that *cool* baths* may be looked upon as those between 66° and 84° Fahrenheit, (15° to 23° R.) and that we ought to call absolutely cold those that are comprised between the point of congelation and 66° F. These baths, forming an important resource of the healing art, and so much used for their preventive and pleasurable effects, ought to be subjected to a rigorous analysis, since the abuses of them from ignorance and false theories, have often converted a most useful remedy into causes of dangerous and even deadly diseases.

Forgetting the different action exerted by warm and cold baths, many writers have freely recommended the one in the same morbid derangements in which the other was found useful: and by a fallacy of observation and indication by no means uncommon, symptoms of an apparently similar character, but occurring in diseases of an opposite nature, have been treated by the same remedy, the cold bath. It behoves us then to commence the present branch of inquiry, by an examination of the various opinions of the most distinguished physicians, on the use of the cold bath—viewing the cool and sea baths as a variety of the first, and

* The limits here given to cool baths, will embrace those in which some writers include the *tepid*—and the remarks relative to the use of the first, will, with few modifications, apply to the latter.

of course the following remarks will apply, with slight modifications, to the three.

Although the practice of bathing in lakes and rivers, and in the sea, be nearly as ancient as the world, yet it would seem that in Homer's time hot baths were most in use—and we learn from Pliny that the cold bath was not general in Rome until after the famous cure of the emperor Augustus Cæsar, which gave such vogue to bathing in cold water, that aged consular authorities, and even the rigid Seneca himself, indulged in this custom. The generally received opinion that Marcellus died from an improper use of the cold bath, is refuted by Louis Bianconi, in his *Lettere Celsiane*, published in 1779, from which we learn that this prince died at the hot baths of Baia.

Little was added in succeeding ages to what was transmitted to us by the ancients on this subject—and it was only towards the middle of the seventeenth century that the practice of cold bathing began to be extended. (See *Hermann Von der Heyde on the surprising effects of cold water, internally and externally.*) Additional attention was excited at the beginning of the last century by Vallisnieri, (*on the use and abuse of hot and cold drinks and bathing*,) and by Floyer in his Psicrologia, since when we have learned little or nothing that had not been already laid down by the ancients, if we except the observations of Baldini, which have some claims to originality.

That we may be guided to a correct view of this remedy, we shall sum up for a moment the immediate effects of cold baths on our systems, and can thence establish the manner and circumstances in which they may be adopted with safety as well as advantage.

Immediately on the immersion of the body in a cold bath, there follows horripilation and tremor, and a general constriction occupying the superficies of the skin, draws it in such a manner as to make it assume that appearance known under the name of *cutis anserinus:* respiration is in the mean time more or less hurried and irregular, the constriction of the pulmonary capillaries producing nearly the same effect on

the lungs, as that just spoken of on the nervous and cellular tissue of the external surface—the pulse is for some moments irregularly accelerated. All these effects gradually subside, except the breathing, in which there is still some irregularity. The universal and consentaneous torpor of the capillaries all over the body, and the diminished action of the heart and larger vessels, are phenomena in direct opposition to the common and erroneous opinion of there being a greater afflux of blood to the viscera, and of the consequent danger of cold immersion or affusion in hæmoptysis. Buchan, Odier, and Giannini* have shewn that the application of cold, so far from being injurious in such cases, is an excellent remedial agent, and Dr. Chapman, in his lectures, urges similar experience. I have myself directed the use of the remedy during the last spring, with decidedly good effects in hæmoptysis, as well in checking the sanguineous discharge, as in relieving the accompanying pain and stitches. To return to a notice of the most common effects of the cold bath. When its use is prolonged, the parts become torpid, are seized with a genuine stupor, and the desire for urinating is from the beginning very urgent. On coming out into a warmer atmosphere, the circulation becomes freer, and a pleasing sensation of heat is diffused over the whole surface—the effect of that mild excitement produced by caloric on the cutaneous system, become now more excitable by the sudden abstraction of this stimulus. Here we may repeat the observation of Marcard, concurred in by every person of any experience on the subject, that cold bathing is only suitable to those in whom such a phenomenon takes place, and that it is entirely contra-indicated in those persons who are slow in becoming warm after it. Galen had early remarked that such baths, *vel roborant, vel obstruunt facultatum et torporem inducunt*, from all which we may conclude that cold bathing, habitually used, can only be adapted to robust habits. Another remarkable symptom is that momentary fulness, or

* See the 13th Number of the Medical and Physical Journal.

rather sensation of fulness of the head, and an almost invincible propensity to sleep, which has been noticed by Buchan in his treatise on sea bathing. This torpor is evidently not the consequence of engorgement, or fulness of blood in the head, but rather of slower and diminished circulation, causing a similar state in the brain to that which is met with in a limb benumbed with cold. All the effects then of the cold bath may be safely referred to a counter-stimulant, or sedative action, in part, but not entirely, owing to the abstraction of caloric. The primary impression, which may be called cutaneous, is rapidly communicated to the internal parts which make a tribute of their caloric, and there results what Athil calls the *tranquillizing property of the cold bath*, which is in fact nothing else but a diminution of motion and sensation—attributes that cannot in any manner exist without caloric. The augmented density, the hardness and rigidity of the skin which covers the parts most exposed to the cold, ought all to be considered as so many effects which serve to guard the system against its morbid influence.

We may now with some confidence make the practical application of the principles laid down above, in proceeding to a consideration of the circumstances under which the cold bath may be safely and successfully used.

And first, in febrile diseases: The cold bath will succeed very well in synocha, by tempering the excessive excitement of the system—provided, however, that such a bath be not temporary, as we shall see is necessary in typhus, and the hot stage of asthenic intermittents: for in the first case, the bath will cure the disease almost radically, and can only act palliatively in the second. Celsus directed that those having the plague should enter the cold bath when the heat appears the greatest—*cum ardentior febris eosdem extorret*. The same practice was recommended by Archigenes and Ætius. Galen even knew the necessity of a continued application of cold water in phrenitis, and in all those cases in which it is required to abstract a large quantity of caloric. Willis speaks of a robust lady attacked

with furious delirium, which was cured by the cold bath, after two bleedings had been tried in vain—and a very remarkable case is related by Noguez, of two men travelling on horseback, in the great heats of summer—one of them fell down dead, and the other, after having also fallen from his horse, was restored by throwing him into a rivulet of cold water. The good effects of ice held to the head in cases of phrenitis, or delirium with strong local determination, is fully recognised in modern practice, and must be familiar to most intelligent physicians. Huxham cured obstinate quartan by temporary immersions in cold water, and found it the most efficacious remedy in the convalescence from this disease, provided there existed a rigid and contracted fibre—and Giannini has found that the most obstinate intermittent fevers will yield to cold affusions during the hot stage, and bark in the intermission, when neither singly was sufficiently powerful to overcome the disease. The same enlightened physician has used the affusions with success in miliary, petechial, and typhus fevers. In corroboration of the benefits of this remedy in the above fevers, and in the yellow fever, and the plague, we may cite the names of De Haen, Gregory, Gerard, Brandreith, Wright, Jackson, Currie, M'Lean, Dimsdale, Selden, Whitehead, Samoilowitz, and Desgenettes. "Affusions of cold water," says Hegewisch, "may be used when the heat surpasses the standard temperature of the body—then only in the acme of the febrile heat, never during the cold stage—the skin should be dry, not moist, much less covered with sweat—there must be no chills, no excessive sensibility, or exaltation of the senses. The remedy is best adapted to fevers arising from contagion, should be used as soon as possible after their invasion, and best of all in the first hot stage succeeding the infection—then may the disease be extinguished in the three first days—and even when it cannot be applied so soon, it contributes greatly to alleviate the symptoms, and accelerate the cure. The cold bath by affusion is contra-indicated when a local inflammatory affection prevails, as peripneumony and dysen-

tery. The greater the heat the colder should be the water, in those fevers properly called typhoid. In the last stage of typhus, when the so called paralytic state has appeared, it is not only useless, but even often fatal." Not less interesting are the observations of Currie on cold affusions, especially in a variety of scarlatina. He makes the same exceptions to the use of the remedy where there is local determination and inflammation—yet more recently Giannini assures us of his having advantageously prescribed it in dysentery and erysipelas. Cold affusions contribute wonderfully in allaying the pain in an attack of gout, as was first noticed by Hippocrates, Aphor. 25, sect. 5.—and in later times confirmed by Homberg, Floyer, Retschen, Giannini, and Franceschi.

In diseases arising from defective nutrition, and accompanied by a slow irritative fever, as in rickets, and *tabes dorsalis*, the affusions of cold water is an excellent remedy and restorative. The same remark applies to those derangements of the cutaneous surface, having their origin in a morbid sensibility of the system, by which it is affected by the slightest alteration in the atmosphere. Continued for some time, this application will assist in warding off vertigo and apoplexy, and in overcoming obstinate constipation of the bowels. In dropsy, we have the authority of the ancients, and the experience of Frank, (*De curand. hom. morb.*) for recommending the cold bath, which has, we are informed, in conjunction with cold injections, been found highly serviceable in tympanitis. We learn from the Transactions of the Medical Society at Paris, that tympanitic horses have been cured by simple clysters of cold water.

The external application of cold water has been highly lauded in tetanus, from the time of Galen, but as yet, little positive information can be advanced on the subject.

Order demands that I should next cursorily notice sea-bathing as a prophylactic and curative agent. Its extensive, and I might almost add, general use amongst the English, entitle their medical writers to speak more confidently than

others, of the range of diseases in which it may be beneficially employed.

According to Kirwan, the mean temperature of the English coast in the month of August, is 64° F. whilst the sea water never descends below 59° F. Yet notwithstanding this small difference, the sea water feels considerably colder than the atmosphere, owing to the diversity of media. Buchan calls the sum of the effects experienced on immersion, a *shock*, and phenomena very similar to those following the cold bath take place. There is generally a strong sensation of cold on coming out of the water, greater even than when in the bath, and which may be attributed to evaporation. This, however, is soon followed by a feeling of pleasing warmth, called by Buchan *reaction of the vital principle*. The same rule applies here as in the use of the cold bath, viz. to suspend its use if the genial glow above mentioned does not soon come on.

The principal advantage derived from the constant use of the cold bath, is to lessen very considerably morbid sensibility to atmospherical vicissitudes—to accustom the body gradually to every species of temperature—and to procure, in this respect, for the rich, the benefits of an active and laborious life, without an abandonment of the pleasures of luxury. On this principle it is that they who bathe in the sea during the autumn, are observed to be less liable to rheumatism and catarrhal affections during the following winter.

It is an opinion very generally diffused, that the period best adapted to sea bathing is before dinner, or early in the morning, when the stomach is empty—since it has been found that persons who bathe immediately after dinner, experience flatulencies and eructations, a sense of heaviness at the stomach, and other symptoms of dyspepsia. It is very proper to rise early in the morning, as the longer sleep is prolonged beyond its natural and necessary duration, the more is the body debilitated and rendered torpid. But persons of a delicate constitution are commonly too much disordered by the morning cold, and diminished

temperature of the water, at such an hour, for reaction to be effected as it ought—and without this, the cold bath is always injurious. Such subjects ought to begin by taking a walk in the open air before breakfast, without, however, prolonging the exercise so far as to produce fatigue, and not to use the bath until some time after having taken food, and then repeat a short walk before bathing, so as not to enter the water with the slightest sense of coldness.

The strong and robust who bathe for pleasure may choose their own time, but to the infirm we must hold a different language. These latter ought to wait for that season in which the water is warmest, which in England is in the month of August, and this month we presume is the preferable one in our own country. The medium temperature of the water of the English coast is at this time 61° F. though sometimes it is elevated to 70° F. but on the approach of rain and stormy weather is much diminished. The best time for bathing is at high tide, when this happens from noon to one o'clock. It was once the custom to bathe in the evening, and this is the period still chosen by those, especially the youthful, who do it simply for pleasure. A bath in the evening usually procures tranquil sleep, a property recognised by the Romans. But the selection of this time is only fitted for those who are accustomed to eat temperately at an early hour, who are not weakened by the fatigues of the day, and who perspire with difficulty. It would therefore be the height of imprudence for those to bathe in the evening, who are fatigued and exhausted with the exertions of the day, who dine late and banquet sumptuously, and who are prone to perspire when asleep, since the bath generally augments such a disposition, and under these circumstances cannot but be pernicious.

There is no opinion more generally diffused, and at the same time more erroneous, than that which forbids the use of the cold bath when the system is heated. Dr. Currie has clearly proved, that all the inconveniences adduced to show the bad effects of immersion in cold water, after the body has been heated by violent exercise, depends not on

the preceding heat, but on the debility and exhaustion of the bather at the time. In such cases, the salutary reaction that ought always to succeed the bath cannot be produced, owing to the loss of that vigour and energy which should arouse it. The most favourable moment indeed, for the use of the cold bath, is during the greatest heat procured by moderate exercise, and when the body is yet in its full strength. Immediately after running, wrestling, or other gymnastic exercises, by which the Roman youth were inured to the fatigues of war, they darted from the Campus Martius into the Tiber, and swam across it once or twice. The Russians and Finlanders on issuing out from their sudatories, in which the thermometer rises to 167° F. (60° R.), roll themselves in the snow at a temperature of 13° to 35° below zero of F.—and so far from this transition rendering the impression of cold more hurtful, they are on the contrary insured thereby the good effects of it. We cannot in fact, too strongly urge on bathers the propriety of taking exercise before cold affusion or immersion. Another consequence of this theory is not to undress until the moment of immersion, or when undressed it is proper to throw over the body a flannel gown, which may be laid to one side at the time of going into the water, and resumed immediately on coming out. Immersion in the water during the whole time of bathing, is far preferable to the person's coming out and plunging in again at intervals, which last practice is apt to produce debility and impede reaction. The fashion of dipping the head first in water is also reprehensible, as unnatural and hurtful, often occasioning headachs, and in one case related by Mr. Odier, (*Bib. Britan.*) hydrocephalus internus followed the plunging headforemost into the water.

Immediately on coming out of the bath it is proper for the person to dress himself quickly, and it is of the greatest advantage for him to wrap himself up in a flannel gown destined for the purpose. After this a short walk may be recommended—keeping within that exertion which would produce perspiration or fatigue. If the heat be slow in re-

turning, we may give a bowl of warm soup or a weak infusion of orange peel, ginger or mace, or if fasting it will be well to take food. It is a bad custom to go to bed after the bath, unless the sensation of cold amount to shivering, and be accompanied with great weakness, in which case the person may be put to bed and a bladder filled with warm water applied to the stomach.

The frequency of the repetition of the baths and their duration, must be regulated by the temperament of the patient. Weak habits should be limited to a bath every second day. In taking it daily, it often happens that they experience fatigue and become reduced, effects which do not follow if a day intervene between the baths.

The pain of the head occasionally supervening on sea bathing, is of two kinds—the first and most dangerous proceeds from a congestion or fulness of the sanguiferous vessels, and is manifested by a sense of heaviness in the head, accompanied with a flushed face, and red and sparkling eyes, and is most apt to occur in persons of a sanguine temperament and robust habit. In such cases the bathing ought to be preceded by cupping, and if this be useless, it ought to be discontinued. The other kind is of a very different description—it is announced by an external pain, accompanied by a sensation of cold in the back part of the head, and is analogous to what is felt in intermittent fever and hysteria. This is obviated by covering the head after bathing with a woollen cap, or by taking some cordial, or tincture of iron. To prevent both kinds of pains it is necessary always to dip or wet the head as well as the rest of the body. Cullen and Buchan, both relate cases of a violent pain in the head after bathing, owing to the persons covering their head with a cap, and carefully avoiding to wet this part.

Though we may not prohibit the pleasures of the table, or dancing, to those whose situation does not contra-indicate these indulgences, yet we are bound to observe, that nothing is more dangerous than bathing in cold water in the morning, after having eaten or drunk too much the preceding evening,

or danced too long in a room in which the temperature was above that of the atmosphere, or finally, when still under the feeling of fatigue from walking or other exercises on the preceding day. Instances are on record, of the most alarming consequences from a neglect of these precautions.

In cases where the cold sea bath cannot be borne, or where it is of doubtful efficacy at first, it is better to substitute water of a rather more elevated temperature, or sponging the surface for several times prior to the use of immersion.

The most decidedly good effects from sea bathing are obtained in chronic diseases, among which the principal are:

First—Scrofula. This disease is often the consequence of a hereditary taint, and seems to depend on an irritation and slow inflammation of the white or lymphatic vessels of the glands, ending in ulceration. Cold has a powerful contributing agency in this disease, as we learn that Creoles and Africans who go to England suffer much from it. Even in animals from warm climates, as in monkeys and parrots, the lymphatic glands of the mesentery and lungs in the former, and under the bill of the latter, are very generally inflamed.

In the varieties of scrofula, termed *spina ventosa*, and *ophthalmia palpebrarum*, and in glandular engorgements of the neck, topical bathing with salt water, or the simple application of strips kept constantly moist with the same fluid, have been attended with a very good effect. In white swellings, a roller, drawn pretty tight on the tumour, should be constantly moist with salt water. In *tinea*, the hair should be cut, as the great profusion of it, very common in scrofulous children, and looked upon as an ornament, is one cause of their pallid colour, and langour, and weakness. The sea water ought in these cases to be somewhat warm before the head is washed with it. Whenever the glands of the mesentery are engorged to such a degree as to cause marasmus, baths will be more disadvantageous than useful, and under such circumstances we must restrict ourselves to the

internal use of sea water. Buchan speaks in very favourable terms of the expressed juice of the *water parsnip* (*sium nodiflorum*) as a remedy, which in doses of two tea-spoonfuls every day, has healed scrofulous ulcers of considerable extent.

Second—Rickets. This disease, generally believed to have been unknown in England until after the middle of the sixteenth century, is now evidently on the decline. Sea bathing is recommended as the most efficacious remedy that can be used.

Third—In the diseases termed *nervous*, Dr. Whytt thinks sea bathing is the most active and safe application. The greatest benefits have been experienced from it in cases of palpitation, dyspepsia, hypochondriasis, headach, constipation, in fine, of all those diseases which depend on debility or atony of the stomach and alimentary canal, or the system at large. Epilepsy and St. Vitus' dance, (chorea) have yielded to this remedy, which M. Dupuytren of Paris, thinks most decidedly efficacious in the latter disease. Marine air accelerates very much the convalescence from hooping-cough, when it degenerates into a chronic disease, and is accompanied by marasmus, and when the cough has ceased, bathing may be employed with the same intention.

Fourth—Persons of a delicate temperament who live in large cities are subject to a species of sore throat, characterized by heat in the uvula, scabrosity of the surface of the tonsils, and commonly aphonia. To these symptoms are usually joined a livid colour and great prostration of strength. This disease, sometimes mistaken for a venereal affection, to the detriment of the patient, whose situation becomes greatly aggravated by the use of mercury, is materially benefited, and occasionally cured, by sea air and sea bathing. Mr. Odier relates a very interesting case of this description, in which relief was only obtained by frictions alternately with warm flannel and ice. The aphonia, or loss of voice, depending exclusively on some affection of the nervous system, is cured by the cold bath.

Fifth—There is a disease very well described by Sanders,

(*Treatise on Mineral Waters, and on Cold and Warm Bathing, &c.*) to which those persons are peculiarly liable who lead a sedentary life, or devote themselves to excessive study, or any other labour of the desk which demands great application. The pulse is constantly frequent—the hands hot—restless nights—and an impaired appetite—but without any considerable derangement in the digestive organs. In such a state, which often lasts for years, and frequently degenerates into confirmed hypochondriasis, there is no remedy more efficacious than the cold bath—and sea bathing has in such cases the peculiar advantage of interrupting the dull routine of business, and affording diversion of the mind from its ordinary train of thinking.

Sixth—Sea bathing is not less useful in all cases of increased evacuations from the perspirable or any other secretory organ, in consequence of a state of debility and relaxation. Redundant pituitous discharges from the nose and fauces, are checked speedily and effectually by this means, or even by immersing the head in cold water every day.

Seventh—In fine, sea bathing, performed with the proper precautions, is usefully adapted to all chronic ailments—to *paralysis* unconnected with apoplectic symptoms, and *chlorosis*, &c. Obstinate intermittent fevers are often overcome by breathing sea air, and making use of the baths—but this must be understood of those cases in which the fever does not result from an obstruction of some of the abdominal viscera. In confirmed *phthisis* no practitioner would hazard the advisal of cold baths, though their use might be serviceable in warding off this complaint when there exists simply a predisposition to it. In *gout*, provided the disease be not irregular, nor of long standing, sea bathing, in the intervals of the paroxysms, may be of some advantage in accelerating the return of health and strength—but if the constitution of the patient have been for some time debilitated by frequent irregular attacks of the gout, cold and sea baths may be fatal. They are very useful in nervous asthma, chronic diseases of the eyes, the pains and tumefaction of the limbs which are often left behind by rheu-

matism—and also in those cases of great irritability and feebleness which often result from a prolonged use of mercury. We have well attested cases of the detergent power of salt water in encysted or steatomous tumours, when the patient has not the courage to risk a surgical operation, or when their situation will not admit of the attempt. The tumour ought to be bathed ten or twelve times a day with the water heated.

All the authors who have spoken of sea bathing, recommend it in cutaneous diseases—though in general, says Buchan, (whose opinions I have been repeating) it appears rather to aggravate them.

Females who take sea baths are often subject to an œdematous swelling of the legs, especially towards evening. A few warm baths, (a remedy proposed by Dr. Darwin, and afterwards highly recommended by Reid in his directions for sea bathing,) will suffice to dispel this symptom.

Persons who have passed the prime of life, when the venous succeeds to the arterial plethora, and in whom there is a dilatation of the cutaneous veins, which sometimes in the legs become varicose, should not expose themselves to the cold bath.

Finally, as respects the cold bath viewed as an agent of hygiene—as a means of preserving health and increasing strength—we cannot indulge in the extravagance of eulogium lavished on it by many physicians, philosophers and others, who have written on physical education. The practice of plunging the new born infant into cold water, may be at once pronounced as unnatural, unsafe, and often dangerous and even fatal, neither justified by physiological reasoning nor experience. The course attended by the least risk, and productive often of decidedly beneficial results, is to commence by sponging or washing the body of the child with warm water, and after the first two weeks gradually to diminish the temperature until it is tepid or cool—ranging from 78 to 60—below which it should seldom go. Then it may be continued as a bath, by immersion, through the years of infancy and childhood, on to puberty, with the effect of

strengthening the system, inuring it to vicissitudes of weather, and rendering it comparatively insensible to the variety of morbid agents to which it is exposed.

Of Warm Baths.

Agreeable to our division, baths under this head are limited between 84° and 98° Fahrenheit. The generally accredited opinion that warm baths are debilitating, may be received as correct, and admits of a ready explanation by the theory which we advanced at the beginning of this essay, notwithstanding the contrary assertion of Marcard. The fact of persons who have been fatigued by great exercise and exposure to a hot sun, being restored by warm bathing, admits of easy solution, if we consider the water in this state as a counterstimulant abstracting the caloric, which in the cases before us proved a morbid stimulus, keeping up indirect debility. The experiments of Maret, performed by immersing pieces of skin in water of various temperatures, and noting the changes thus induced in it, are entitled to no weight, owing to the absence of the modifying, and we might say, all-controlling power of vitality. The arguments against the enfeebling power of warm baths, drawn from the custom in some places, as at Leuk in Switzerland, and Laudeck in Silesia, of spending hours together in the bath, will be met and explained when I come to treat of these and other thermal waters. It is sufficient for our present purpose to repeat here the language of Tissot, who says, that if this species of baths (warm) often produces notable benefits, it happens in cases of irritation, inflammation and rigidity—and the additional testimony of Sign. Bachetti, who, in his *Osservazioni sulle Acque minerali della Porrella*, tells us it has been his lot to see the bath borne for two hours, and repeated twice a day with incredible advantage. Such subjects, however, he adds, were of the most juvenile and robust class: had the feeble and aged attempted, through whim, such an experiment, they would have experienced fatal consequences.

We have hence a right to infer, that warm baths are the best counterstimulants for those persons in whom there exists an excessive rigidity of fibre—that they become absolutely debilitating for all those, who, enjoying a medium state of excitement, support badly any sensible abstraction of stimuli—and that, in fine, they appear to be corroborants with those individuals only, who, being oppressed by an overload of stimuli, have their excitement brought to an equilibrium by the means of these baths, which hence appear, but illusorily, a restorative, as bleeding seems to be when we draw off that excessive quantity of blood, which, being a weight in the system, effectually oppresses and enfeebles it.

This truth will appear in fuller light by an enumeration of some of the diseases of the human frame, in which practitioners are agreed, not only as to the safety, but the efficacy of warm bathing.

The application of this remedy in acute diseases is of very ancient origin. The Hindoos practise it from time immemorial. Hippocrates mentions it in various parts of his work, and gives us precepts consecrated by the experience of afterages. He particularly praise sit in inflammatory attacks of the lungs, and pains of the kidneys, but rejects its use when bile and saburræ abound in the first passages. Galen, after the evacuation of the intestinal canal, directed warm bathing in the so called putrid fevers. Celsus, Cœlius Aurelianus, and a hundred others, eulogise this application in febrile diseases. Huxham praises it in inflammatory fevers, and Peter Frank speaks of a double quartan resisting every other remedy, cured by warm baths. Marcard, Zimmerman, and Tissot, extol them also in those *febriculæ*, chiefly marked by frequency of pulse and a sense of heat, to which practitioners give the name of slow nervous fever. By the same means we aid in the cure of external inflammations, as measles and ophthalmia, as observed by Hippocrates, Galen, Ætius, Sennertus, Riverius, and later physicians. In all the phlegmasiæ, pleurisy, peripneumony,

cynanche trachealis, *hepatitis*, *enteritis*, *nephritis*, and in all pains accompanied by inflammatory action, the use of the warm bath is followed by the best effects. Bilious colic, and *colica pictonum*, are more peculiarly kept in subjection by this remedy. Catarrhal affections, diarrhœa and dysentery, which so often occur from a derangement of the cutaneous functions, the consequence of alterations of temperature, are often cut short and cured by warm bathing. Franceschi says, that even hemorrhages do not contra-indicate its use, nor does he ever suspend it during the time of the menstrual discharge.

The *neuroses*, or diseases from augmented sensorial power, and which, for the most part, are manifested by irregular movements of the muscles, such as convulsions, spasms, hysteria, palpitation, spasmodic asthma, cough likewise convulsive, &c. are greatly soothed by warm baths.

They cut short gouty and rheumatic paroxysms, and are useful in chronic cutaneous disorders. Astruc recommends them as facilitating the distension of the matrix, thereby preventing abortion in women of a rigid fibre, and rather advanced in life—and we are assured that the French still keep up this commendable practice of bathing gravid females throughout the whole time of gestation. These baths second the action of mercury, and promote its absorption—and still farther, they remove the morbid sensibility of those who have been under the use of mercury for some time for lues, and in whom the secondary state is often confounded with the symptoms of the primary disease.

Warm bath, in the opinion of Celsus, should be used by those who prize the preservation of cleanliness of the body. In moderation, they are peculiarly serviceable in rigid and irritable habits, by mildly fomenting, as it were, the dried fibres, and maintaining in them a greater flexibility.

The limits allowed me on the present occasion are not sufficiently extensive to embrace the medical history of *hot* and *vapour baths*, and *douches* or *spout baths*, which may, however, be introduced with propriety in the next

number of this Journal, as prefatory to the second part of our subject, or a sketch of the chemical composition and medical properties of the principal mineral springs of Europe.

Art. V. *Remarks respecting* Mr. Vanuxem's *Memoir on a fused Product, erroneously identified with the fused Carbon of Professor Silliman—with some additional facts and observations.* By Robert Hare, M. D. Professor of Chemistry in the University of Pennsylvania.

PROFESSOR Silliman, about two years ago, published an account of some phenomena observed during the ignition of pieces of charcoal by a galvanic deflagrator, the poles of which they had been severally employed to terminate. On the charcoal attached to the positive pole, a projection was observed to ensue—in the other, a corresponding concavity. The projection he supposed to consist of carbon, fused, volatilized and transferred, from the charcoal of the opposite pole, where the concavity was discovered.

In a late number of the Journal of the Academy of Natural Sciences of Philadelphia, Mr. Lardner Vanuxem communicates his observations on a supposed specimen of fused charcoal, sent to Professor Cooper by Dr. Macneven of New York, which appears to have been iron—and the author appears to have received, and evidently intends to convey, the impression, that the substances considered as fused or volatilized carbon by Professor Silliman, must have been similarly constituted.

Mr. Vanuxem, speaking of the mass which he has examined, informs us, that "it consisted of one large and one small globule, connected together by a thread, or thin bar, of the same material, and resembled a double-headed shot."

And again he says :—

"It was then put into an agate mortar, pressed and struck with considerable force—finding it yielded without breaking, and observing that it received a polish, it was examined and found to resemble iron. To confirm the analogy, it was next tried with a file, which acted upon it as it would on soft steel or iron—after this it was subjected to a magnet, to which it readily attached itself—and lastly, with a hammer: by its great malleability, conjoined with the characters just mentioned, it proved its identity with iron."

He moreover states, that the substance in question was attacked by nitric acid, and afterwards was chiefly taken up by muriatic acid, whence an hydrated peroxide of iron was precipitated by ammonia.

On reading this account of the substance examined by Mr. Vanuxem, it was evident to me that it had not the slightest resemblance to those which Professor Silliman had described as fused carbon. A product which I had myself obtained, and which corresponded perfectly with his description, had been preserved in a glass tube. This substance crumbled, when subjected to pressure—acquired no polish by hammering or filing—was utterly devoid of attraction for the magnet—was not acted upon by nitric acid—nor did muriatic acid, which had been digested on it, yield any oxide of iron, or give any other indication of that metal.

These observations were made by my friend Mr. G. T. Bowen, under my inspection. Mr. Bowen assisted Professor Silliman at the time when he first made his observations on the fusion of carbon. On perusing Mr. Vanuxem's memoir, Mr. Bowen was no less convinced than myself, that there had been a mistake, which, considered as the foundation of a broad and unreserved, though indirect, contradiction, given to Professor Silliman's representations, is really unfortunate.

I do not feel authorised to decide whether the substance analyzed by Mr. Vanuxem, was that which Dr. Macneven forwarded. By *oversight*, one minute portion of matter may

be exchanged for another, as easily, as mistaken—but supposing that the mistake originated with Dr. Macneven, it should be recollected that he did not act under the idea of any serious responsibility. He was writing to a friend, not controverting the conclusions of a skilful chemist.

It was in January last that Dr. Macneven first operated with a deflagrator. I then sent him the first he ever had. Notwithstanding his well known accuracy, in cases where his opportunities of observation are duly great, it is not unaccountable that amid the hurry of his lectures and his practice, he should have mistaken a globule of iron for a specimen of fused carbon. But considering Professor Silliman's great experience and skill as a mineralogist and chemist, and his having operated with the deflagrator for nearly a year before his memoir on the fusion of charcoal was published, it ought not to have been so readily supposed, that in scrutinizing the substances which he had obtained, *with a view to communicate the result to the public*, any *advantageous* employment of the magnet, the hammer, the file, or the mineral acids, had been omitted.*

It is true, as Mr. Vanuxem observes, that the incineration of charcoal proves it to contain impurities—but those impurities are well known to be earth or alkali, with a very minute portion of iron, if any. These facts, thus cited by him, are therefore irreconcilable with his inference, that a piece of charcoal of about an inch in length, and less than a quarter of an inch in thickness, could, instantaneously, at its point, form a projection of matter almost solely ferruginous.

I will conclude by observing, that the most interesting phenomena observed by Professor Silliman, do not to me

* It appears from Professor Silliman's memoir, (vol. V. page 363, American Journal of Science,) that he did employ boiling sulphuric, and boiling nitric acid--and moreover, it is evident that the products which he represented as fused carbon, could not have been iron, both on account of their habitudes with these acids, and on account of their disappearance when subjected to the solar focus in oxygen gas. Of course no *advantageous* application of the magnet could have been made.

appear to be dependent for their importance on the nature of the projection which arises on carbon, when forming the negative pole of the deflagrator. That such an excrescence arises, and that a corresponding crater or pit takes place in the charcoal on the opposite pole, are the facts which principally interest me.

I should have done more to prepare myself for the solution of the doubts, which have been excited respecting some of the observations of Professor Silliman, had not my eyes been so much affected by a powerful deflagrator, made about two years ago, as to be distressed by any subsequent employment of them in the same way.

From a cursory observation made last winter, I was led to suppose, the light of the deflagrator to be equal to that of sixteen hundred candle flames, condensed within a space no larger than that usually occupied by one.

Since the above was written, in trying a deflagrator made for Professor Nott, the operator had his eyes so much affected as to be bloodshot next day.*

By means of the same deflagrator, a specimen of the fused or volatilized charcoal was obtained. This did not prove to be magnetic. Instead of being malleable, or susceptible of a metallic polish, it was friable, and the fragments were without brilliancy. Seen by the aid of a powerful microscope, before it was broken, it was, both in colour and shape, exactly like the depositions or concretions of carbon, which have been formed in some instances during the gas-light process.

P. S. It is remarkable, that since the observation last mentioned was made, I have found that Mr. Conybeare, in

* I have considered it proper to dwell on the injury thus sustained by the eyes, that others may by due caution, in the first instance, avoid the evil. The deepest green spectacles should be used, putting two glasses together, when one is not enough. Persons not provided with proper spectacles, may use a piece of card, or paper, pierced with some fine holes. Through a hole made by a pin, the phenomena may be viewed satisfactorily.

some speculations on the concretions of carbon, noticed in gas-light cylinders, infers, that they may have some analogy with the products described by Professor Silliman as fused carbon.

Art. VI. *Thoughts on the Causes, Phenomena, and Laws of Epidemics, with suggestions for their prevention and suppression.* By N. Chapman, M. D.

In the ensuing essay, it is intended to present some of the results of my observations, and inquiries into the causes, phenomena, and laws of epidemics, with suggestions for their prevention and suppression. Desolated as our country has been, and probably may again be, by this form of disease, surely there is no investigation, which to us can be more interesting or important. But the subject is so vast, and abounding in materials so copious and diversified, that all I can hope to effect within the narrow limits to which I am necessarily restricted, is a sort of synopsis or sketch, to be hereafter filled up and rendered more perfect. In entering on the inquiry, I am fully aware of the difficulties I have to encounter, as well from the circumstance alluded to, as on account of the extreme obscurity in which the various epidemic influences and their laws are involved.

By an epidemic, we mean a disease of general prevalence, extending over wide districts of country at the same time, or in rapid succession—observing in its attacks much similarity of character and symptoms.

The ravages of this form of disease, have always excited the utmost attention to its causes—and much loose and idle speculation has been advanced on the subject. By the ancients, and most nations in their ruder ages, epidemics have been referred to the malevolence of their peculiar di-

vinities—and sacrifices and other votive offerings made to appease their wrath, or propitiate their kindness. To stay the progress of the pestilence which afflicted the Grecian camp during the siege of Troy, we are told by the poet who has commemorated that event:

> "Let then some Prophet, or some sacred sage,
> Explore the cause of great Apollo's rage;
> If broken vows this heavy curse have laid,
> Let altar's smoke, and hecatombs be paid:
> So Heaven aton'd, shall dying Greece restore,
> And Phœbus dart his burning shafts no more."

A sounder philosophy, and a more accurate observation have, however, shown, that they are probably owing to the influence of a single, or combination of physical causes—and among these is a vitiated condition of the atmosphere, induced either by changes in its sensible qualities, or by the introduction into it of certain pernicious or deleterious impregnations. An opinion indeed, of this nature, somewhat vaguely conveyed, was adopted even by the Father of medicine, who alleges the occasional existence of a pestilential constitution of the air, from the protracted continuance of hot south winds, loaded with humidity. But in other parts of his writings, he seems more mystical, bringing to the explanation of the phenomenon, the aid of a divine principle in the air, denominated Θειον—by which, however, some of his commentators suppose he meant nothing more than certain occult causes, to him unintelligible.

Epidemics connected with the season, or prevailing temperature, may in most instances be traced to the causes which I have assigned. But there are others of occasional occurrence, that sweep in rapid succession over the whole face of the globe—the origin of which, seems not to be dependent on any local or obvious causes, and is, therefore, wrapt in an inexplicable mystery. The destroying angel in these cases, moves on with steady regularity, without our being able to arrest his steps, or divine the precise

agency he employs. Epidemics of this description are usually, though very vaguely, imputed to some distemperature of the atmosphere—and recently it has been attempted to be shown by a regular deduction from historical evidence, that their occurrence is intimately associated with the eruption of volcanoes, with the convulsions of earthquakes, with the coming of comets, or the appearance of meteors, with violent tempests, and other natural events or phenomena, equally great and portentous.*

Whether this hypothesis be well founded, I will not positively pronounce, though the facts which support it are numerous, and some of them very satisfactory to my mind. Be it as it may, it can in no view be considered, except as the first link in the chain of causation, and affords no solution of our difficulty and embarrassment concerning the production of the form of disease before us.

As regards the morbific influence of comets, more particularly, the notion seems early to have been entertained. Claudian tells us—"In cœla nunquam spectatum, impune cometam"—and the same has received the countenance of Riverius, Horstius, and several other writers on pestilence. During the age of astrology, much was ascribed to planetary influence generally—and though, as a cause of epidemics, we have no direct evidence, its agency in the origination, as well as in the modification, of certain diseases, is abundantly attested on the authority of Lind and Balfour, and by very common observation.

In this discussion, however, in order to attain perspicuity, and to give to it a more practical bearing, it will be proper to enumerate distinctly the causes of epidemics, as

* Webster on Pestilence. This, though not the production of a physician, is a most erudite and philosophical treatise on the subject of epidemics, singularly distinguished by curious and recondite research, and by original and profound views—affording such an abundance of facts and references, that little is reserved for the subsequent labourer in the same field, than to give to the materials thus accumulated a more precise, regular, and definite form. Every candid investigator of the subject, must be compelled to make this acknowledgment.

now received, in connexion with the several varieties of disease included under this general denomination.

I shall commence with the sensible qualities of the air.

The influence of heat in the production of certain epidemics, is universally confessed. It has indeed been proverbial from the dawn of medical science to the present day, and hence, in the writings of the Greeks, the Romans, and the earliest productions of the moderns, a burning atmosphere, and devastating diseases, are constantly associated as cause and effect. Even the poets, who, though styled "the sons of fancy and the fathers of fable," are indisputably among the most accurate observers of nature, have not less uniformly connected the rage of the dog star with the ravages of pestilence. The Iliad contains several allusions to this purport.

> "As vapours blown by Auster's sultry breath,
> Pregnant with plagues, and shedding scenes of death,
> Beneath the rage of burning Sirius rise,
> Choke the parch'd earth, and blacken all the skies."*

In a subsequent passage of the same divine poem, we have a similar description even more forcibly expressed.

> "Not half so dreadful rises to the sight,
> Through the thick gloom of some tempestuous night,
> Orion's dog, (the year when autumn sways,)
> And o'er the feebler stars exerts his rays:
> Terrific glory! for his burning breath
> Taints the red air with fevers, plagues, and death."

The morbific influence of such a state of the atmosphere, long protracted, we have illustrated in our own climate, and still more so in the tropical regions. Not to refer to other facts, we have seen, during the last three years, every variety of autumnal disease, prevailing to a great extent through different sections of the United States, sometimes in positions so elevated, with the dryest soil, and so remote

* Book V.

from sources of miasmatic influence, as to preclude the suspicion of its existence. In further confirmation it may be stated, that for the production of yellow fever, a high degree of temperature, steadily maintained, seems to be required. It is at least affirmed, that every season in which that fever has occurred in this city to any great extent, a thermometrical register, accurately kept, shews the average heat during the months of June and July to have been 79° of Fahrenheit—and conversely, that in the intermediate seasons, when we escaped, the weather was considerably cooler.*

As regards the city of Havana, I have learnt from unquestionable authority,† that the fever, for the most part, breaks out in a situation where no other cause than excessive heat can apparently operate, and such, I have reason to believe, is pretty generally the case in the West India Islands.

The action of heat, under such circumstances, is very intelligible. It is a direct stimulus, exciting the system at first, though it speedily leaves it in a state of extreme lassitude, which renders it vulnerable to the attack of various diseases, either purely febrile, or blended with gastric, hepatic, or intestinal disturbance.

Cold is another quality of the atmosphere which is a prolific source of epidemics, and in some instances of frightful malignity. It was long ago proved by Heberden, that intense and enduring cold never fails in Britain to generate some new epidemic, or exceedingly to aggravate and multiply the cases of the existing diseases. The same has since been amply verified by several writers, among whom may be cited Fothergill, Sims, Willan, and Bateman.

To epidemics, the north of Europe is singularly exposed during winter—and we all know how much every portion of the United States suffered by a disease, ascribed, with

* Eclectic Repertory, vol. VII.

† This communication has been made to me by Dr. Osgood, a most intelligent physician, who resided for many years in that Island.

some probability, to the severity of several successive seasons. My allusion is to the typhous or spotted fever, which, commencing in the eastern extremity of our continent, moved on progressively to the south, producing in its feli career universal terror and devastation.

Even where epidemic disease does not immediately result from the influence of cold, it hardly ever fails to appear the succeeding summer, provided it be unusually hot and dry, or close and moist. To this purport, many instances might be cited from the records of medicine.

The action of cold is much modified by the manner and degree in which it is applied. Exposed to a low temperature for some time, the system undoubtedly becomes depressed—and here it operates as a sedative, inducnig predisposition to the weaker or typhoid varieties of disease. But, suddenly and forcibly applied, its effect is diametrically opposite—or it is a stimulus, proving an exciting cause of a multitude of affections, the predisposition to which had been otherwise laid.

In the nature of the diseases produced by the opposite agencies of cold and heat, the difference mainly consists, so far as regards fevers—in the one, the pulmonary organs and their immediate dependencies being mostly affected, while in the other, the chylopoietic apparatus and its connexions become involved.

Much has been said of the humidity of the atmosphere as a cause of epidemics. It is, indeed, by some writers, held to be as pernicious as either of the preceding qualities, and this is confirmed by popular prejudices. No one will deny, that very great and sudden transitions in weather, of any description, have an influence on health. By a law of our system, any new impression made upon it, changes its actions, and disposes it, most generally, to take on those, in a greater or less degree, of a disordered nature—but how far a climate permanently moist has the same effect, is not so accurately ascertained.

Enveloped in perpetual fogs, we behold the Hollander one of the most vigorous of his species—while the Italian,

who lives under a sky of perennial brightness, is puny, cadaverous, and sickly. The contrast might be extended into other sections of the world, and with precisely the same results.

Considering the very striking analogy in the economy of animals and vegetables, it is not at all unlikely, we shall hereafter discover, that a certain degree of moisture is equally indispensable to the existence and well being of both. Let it, however, not be understood, that any thing I have said, goes to impeach the common impression, that humidity, under certain circumstances, may operate as a cause of epidemics, though we must not impute too much to its effects. When it does, it seems to be merely by inducing chilliness, so promotive of the action of miasmata or contagion, or as a vehicle for such poisonous matters, and not as a direct or proximate cause. The influence of rains will be presently considered.

Dryness of the atmosphere has also been not a little insisted upon, as one of the sources of epidemics. That such is the case as regards certain countries of the old world, there can be no doubt. We read, indeed, that the atmosphere of the burning deserts of Arabia becomes at times so arid and parched, as to be rendered nearly unfit for the purposes of respiration. On these occasions, it is said to absorb so rapidly the moisture from the fauces and lungs, as to create an insufferable thirst and stricture of the thorax, attended by a distressing sense of suffocation—the perspiration at the same time is so completely carried off, that the skin is as dry and harsh as parchment, with a scorching sensation, as in hectic fever. These effects are induced by the Sirocco wind, which consists of a current of air, deprived of its moisture, by sweeping across the hot sands of the deserts to which I have alluded. During its continuance, epidemics have sometimes, though very rarely, burst forth.

On this point, however, we have more direct and conclusive evidence. The long prevalence of hot southerly winds has, indeed, at all times, and nearly in every country,

been productive occasionally of such an effect. Hippocrates speaks emphatically of the "constitutio austrina" proceeding from this cause—and most of the historians of pestilence fully accredit its influence. In the memorable plague at Marseilles, it was particularly remarked, that the mortality vastly increased when the wind was from the south—and the same happened in Egypt, according to Assalini—and in Gibraltar in 1810 and 1813—at Noya in 1816—and, on the recurrence of north winds, a correspondent diminution took place, till a final extinction of the disease. It is a fact, I believe, well established, that on the setting in of the Etesian or north wind, the plague of Egypt ceases—though the whole effect cannot be ascribed to this cause, as the inundation of the Nile occurs at the same period, covering its paludal borders.

Commonly speaking, in the United States, and other similar climates, dry weather is salutary—but this, perhaps, is not owing so much to the mere quality of dryness, as to an exemption from the deleterious exhalations which are raised by the alternations of heat and moisture. Exceptions, also, to the observation I have made of the salubrity of our droughts, may perhaps exist. In some very dry summers, I think I have known such a degree of aridity in the atmosphere as to be mischievous. By drawing off the perspirable matter as rapidly as it does, we are rendered uncomfortable, and extreme languor and exhaustion ensue, which must predispose to general disease. The summer of 1822, when our late epidemic commenced, was in this part of the country remarkably dry.

The experience of other countries, however, is still more conclusive. In his Treatise on Epidemics, we are told by Hippocrates, that during a very hot and dry season, when the usual refreshing Etesian winds did not blow, ardent and malignant fevers, attended with fluxes and cutaneous eruptions, prevailed to an enormous extent.*

Livy also informs us of a similar state of things in the

* De Morbus Vulgaribus, lib. III.

Roman territories, from a severe and unremitting drought. "The cattle," says he, "thronged in multitudes round the arid fountains, and perished with thirst—diseases followed among them, whence they were propagated by contagion among men—the peasantry first suffering, then the lower classes, and at length the whole city became infected."*

In more modern times, no less striking instances have occurred. It is recorded by Bartholine, that a pestilential fever broke out in Copenhagen, after an uncommonly hot and dry summer—and we have a similar statement by Silvius in relation to Leyden.†

Diemorbroeck also tells us, "that during the plague of Nimeguen, the summer and autumn were extremely hot, with such drought as scarcely ever was remembered:"‡ and we learn from Sorbait, that while the same disease prevailed at Vienna, the winds "were imprisoned as in a dead calm for three whole months."§

Of late, several ingenious speculatists have been led to impute not a few of our diseases to a rarefied state of the atmosphere. That the air of Alpine and other elevated positions, produces a laborious and painful respiration, with many other morbid effects, is admitted—and hence it is presumed, that where such a state of atmosphere generally exists, it has a baneful tendency.

All the travellers whose reports on the subject I have consulted, agree, that on ascending mountains of the greatest altitude, their corporeal as well as mental functions were affected in a most extraordinary manner. But the celebrated De Saussure, a writer who unites to the profundity of philosophical research, the polish of literary refinement, has from personal experience, described these affections with the utmost precision. To his description I shall therefore principally adhere.

He states, that at a certain height above the level of the sea, there uniformly takes place, a sudden and uncommon

* Liv. lib. IV. p. 30. † Pringle on the Diseases of the Army.
‡ De Pest. cap. iii. & v. § Van Swieten's Commentaries, vol. V. p. 166.

exhaustion of the muscular power. The natives of the Alps, who can climb for hours at the foot of mountains without being at all wearied, are forced to stop and take breath every few minutes, when they ascend the height of fourteen or fifteen hundred toises, and those less accustomed to the air of the mountains are obliged to rest much more frequently.

The fatigue induced in this situation, is indeed so intolerable, that the individual is rendered sometimes wholly incapable of motion. In an attempt to move, his legs sink under him, his heart palpitates, his arteries throb, his head becomes giddy, his eyes are dazzled, and to avoid fainting he is forced to sit down. Near the top of Mont Blanc, our traveller could not advance more than a few steps without stopping to respire, and on the summit of it, though his exertions were moderate, he was constrained frequently to desist altogether, and to breathe deeply, to recruit his strength.

These effects are not peculiar to the human species. The same writer relates, that the mules which he employed to carry his baggage, became suddenly so weak and exhausted that they could not walk, even when the burden was removed from their backs. They staggered as they moved, their respiration was panting and difficult, and seemingly attended with painful sensations of the chest, as they uttered plaintive and distressing cries.

With this excessive degree of fatigue, accelerated pulse and difficult respiration, there is great thirst, sickness of stomach, loathing of food, and an aversion to every species of spiritous liquor. But what is very curious, these affections are as short in their duration as they are violent.

After resting a few minutes, the sense of fatigue is so completely dissipated, that on resuming the journey, the person feels such a renovation, that he is persuaded he will be able to prosecute it uninterruptedly. But he is soon disappointed, as on going a short distance only, his former inability returns, and his progress is again arrested.

An additional effect of this state of the atmosphere, is

an almost irresistible propensity to sleep. We are told that if the attention be not engaged and kept excited, he will, when pausing to rest, often fall to sleep instantaneously, though annoyed by the wind or cold, the light or heat of the sun—and in the most incommodious and disagreeable posture of body. This sleep sometimes approaches in soundness nearly to lethargy—and it may moreover be observed, that Aëronauts have generally mentioned drowsiness as one of the consequences produced by the attenuated atmosphere of the exalted regions which they reach in their excursive flights—and some have even declared that they slept soundly, when at the utmost pitch of their perilous adventures.

It is stated by Baron Humboldt, that in ascending the Andes in South America, near the top he experienced all the inconveniences described by De Saussure, and even in a greater degree, as he had hemorrhages from the mouth and nose, redness of eyes, and violent vomiting. By his eudiometer he proved, that there were only eighteen parts of oxygen in the atmosphere.

Two Italians, who ascended at Padua, nine miles high, experienced even more distressing effects. At a certain height one of them became sleepy, and finally comatose. The other, nearly in the same state, had also his body enormously swelled, as in general dropsy.

Now in what manner are all these singular affections to be explained? They are in part owing, most probably, to the diminished pressure of the atmosphere, though infinitely more to the deficiency of oxygen, which seems to exist under such circumstances.

Directly an opposite state or density of the atmosphere, is also exceedingly distressing, and may become a cause of disease. Its primary effect is oppressive respiration, and when excessive, or long continued, hemorrhages and pulmonary and cerebral affections are induced. Every one has experienced in a crowded room, or in other positions, where the air is deficient in elasticity, more or less of the inconveniences which I have noticed. These, however, are most

afflicting to individuals with weak chests, and tendencies to pulmonary disease. Existing in a greater degree, this state of air is productive of more serious, and I may even add, of fatal effects.

As causes of epidemics, having completed the account of the sensible qualities of the atmosphere, I proceed next to the investigation of its influence in a vitiated state.

That the air we breathe may become very essentially changed in its character, by an admixture of a great variety of pernicious and even deleterious articles, is well known. The contamination, however, of the greatest extent and mischief, undoubtedly proceeds from *marsh effluvia*, or *malaria*, as more recently termed. This is the discovery of Lancisi, an Italian writer, who promulgated it early in the last century.

Notwithstanding the scrutiny the subject has since received, we are still ignorant of the precise nature of these pestiferous exhalations. They have been supposed to be azote, carbonic acid gas, hydrogen, carburetted hydrogen, and sulphuretted hydrogen, without, however, any foundation. Examined by the eudiometer and other tests, the atmosphere containing them affords none which are cognizable, nor manifests even any change in its own constitution.

By Professor Julia, of Lyons, experiments, formerly made by others, have recently been repeated to the extent of sixty times, with apparently much care and precision, on the atmosphere of marshes in various positions, as those of Cercle, near Narbonne—of the pond of Pudre, near Sigéan—of Salces and Salanque, in Roussillon—of Capestang, not far from Béziers, and those along the coast of Cette—from which he deduces the following results.

First—"The nature of those exhalations is wholly unknown—but there is every reason to believe their deleterious effect is owing to a portion of putrefied animal or vegetable matter, dissolved and retained by the gas."

Second—"The air of marshes does not differ from atmospheric air in any principle of which chemical analysis can show the existence."

Third—"None of the gases disengaged from bodies in a state of putrefaction, exhibit themselves in a sensible quantity."

Fourth—"That it is an error to attribute the disorders caused by marsh air to the predominance of azote, of carbonated hydrogen, of ammonia," &c.

Fifth—"That those matters, even in a sheer state, occasion only momentary effects, as gases not respirable, and generate no subsequent disorder—a fortiori, when they are diffused in an imperceptible quantity through the atmospheric air, no effect of that nature can be imputed to them."

Experiments calculated to shed further light on this subject have also been made by De Lisle, who selected for the purpose the Pontine marshes. As a summary of the whole it may be stated:—

First—That miasmata possess such gravity that they never arise in the atmosphere, unless aided by a lighter body, by which they are carried into it.

Second—That they have no perceptible smell, and may be separated from odours with which they accidently become associated.

Third—That it is aqueous vapours which hold them suspended in the atmosphere.

Fourth—That various obstacles form barriers which they cannot pass, and against which they are deposited.

Most of these results, we shall presently see, are confirmed by facts which have been long observed.

But though in this respect miasmata elude our researches, it has been thought, that the circumstances under which they are generated were ascertained with some certainty, and that they are a subtile and poisonous emission, perhaps exclusively from vegetable matters, in various states of decay. Diseases of which they are the cause, generally prevail, and hence such situations are presumed most favourable to their production, in the vicinity of marshes or swamps, along the margin of rivers, or lakes, or pools, or wharves recently filled up, and faced with wood—in moist alluvial soils, or other lands occasionally inundated, and especially

if newly cleared, with the stumps, or trunks, or branches of trees left to rot.

These are views, which, for a long time, were entertained on this subject. But of late, the accuracy of them has been denied, and with so much weight of evidence, and plausibility of reasoning, as to claim our serious attention. It is the opinion of a highly authoritative writer, deduced from a close observation of facts, in different regions most favourable to the investigation, that the generation of miasmata has no connexion either "with *aqueous* or *vegetable putrefaction*." To the production of the marsh poison, he maintains, "that the only indispensable condition is paucity of water, where it has *recently abounded*, and that it is incident to the last or very advanced stage of the *drying process*. It is, according to him, from the saturated, half dried and drying margin of lakes, pools, and marshes, that it emanates, and not from the water they contain, which must be "absorbed into the soil, and disappear to the eye before it can produce any mischievous effects."*

Having occasion hereafter again to refer to this point, I shall now pass it over with the single remark, that though there is very strong reason to believe that vegetable putrefaction, however large the accumulation of materials, is seldom productive, in the first stage, of noxious miasms, still we are not without facts to warrant an opposite conclusion. The evidence indeed, is so weighty on each side, that in the existing state of our knowledge, it is hardly safe to come to any positive conclusion—the question being left in that state of doubt, which should serve to stimulate to further inquiry and more accurate observation. Be it alleged, as it has been, that, without detriment to health, the most luxuriant vegetation is seen to rot in our fields, and in the barn yard of every farmer immense compost heaps are daily stirred up and mixed, the

* Ferguson on Marsh Poison. Phil. Med. Journal, vol. VI. from the Trans of the Royal Soc. of Edinb.

more effectually to promote the decomposition of the mass, to fit it for manure, in which there must be of course, a prodigious elimination of gaseous matters—it may at once be replied, that independently of other facts, we have been taught by sad experience, that vessels with cargoes of tropical products, in a state of decay, have often brought us the most malignant fevers. In one instance particularly, the disease was clearly traced to a quantity of putrid coffee thrown on our wharves.*

Contrary too, to the prevalent opinion, it has lately been determined, that the production of miasmata is not at all confined to paludal sources. These, undoubtedly, most copiously supply such exhalations—though they may arise in nearly every position, and are found sometimes to be thrown up in immense quantities, especially in an argillacious soil covered by woods or otherwise, even in mountainous regions. By Professor Van Aenvanck of Louvain, it is indeed insisted, and by no means idly, that the cause of intermittent fevers, &c. is owing "to a vice inherent in the soil itself, and that clay, of all earths when in a state of moisture, from its great affinity to oxygen, is most apt to deteriorate the atmosphere and induce such diseases." We have long been embarrassed to account for the origin of intermittents and other miasmatic diseases, under such circumstances. This discovery is calculated, in many instances, to remove the difficulty and solve the problem.

That miasmata are never generated to any extent, at less than 80° of Fahrenheit, though they may partially, at a somewhat lower temperature, has been said. This was the opinion of the late Professor Rush, which, however, can not be received without some qualification. It is more than probable, as will hereafter appear, that an intense heat is required, as well for the free evolution, as for the modification of miasms. Yet it is reasonable to presume, that under all circumstances of putrefaction, and this takes place at

* Rush on the Yellow Fever of 1793.

a much more moderate temperature, exhalations are disengaged.

In this process, a limited degree of moisture is also required—the product being, in both respects mentioned, affected by a deficiency or excess of it. The instances are many in the history of our own and of other climates, where very dry or rainy seasons have proved comparatively healthy, owing to the want of miasms.

Heavy rains likewise operate, by so completely covering the surface of the earth with water, that nothing baneful is permitted to escape. It has often been remarked, that while low grounds, in such a state, remain healthy, the more elevated districts of country are afflicted with the ordinary autumnal complaints. The reason of this difference is to be sought in the one being entirely overflowed, and the other only moistened, or imperfectly covered with water.

I before alluded to the suppression of the plague, at the period of the inundation of the Nile. In his treatise on the diseases of negroes in the West Indies, Dazille tells us "that the rainy season is the most healthy at Cayenne, owing to the neighbouring morasses being deeply overflowed: whereas, at St. Domingo, a dry season is most productive of diseases, owing to its favouring those degrees of moisture which produce morbid exhalations."* By Ferguson a similar remark is made. The same rains, says he, in different islands of the West Indies, "which make a dry marshy country perfectly healthy, by deluging a dry well cleared one, where there was any considerable depth of soil, speedily converted it, under the drying process of a vertical sun, into a hotbed of pestiferous miasmata."†

During our late epidemic, several of the low places in the neighbourhood of this city, which had been formerly stigmatised for the production of autumnal diseases, entirely escaped, while the elevated and healthy grounds became exceedingly sickly. Yet, on the whole, wet seasons are found most favourable to miasmata, and of their morbid conse-

* Rush's Med. Inquiries and Observations, Vol. III. p. 108.

† Ferguson on Marsh Poison, Phil. Med. Journal, Vol. VII.

quences—in support of which, we might appeal to the medical records of our own country, and to common observation and experience. The same is equally well authenticated as regards the inter-tropical and other warm climates.

In noticing Guinea, Lind says, "this has, properly speaking, only two seasons, the wet and the dry. The former is commonly of about five months continuance, and is the season of sickness—whereas, for many months in the dry season, most parts of this country are equally healthy and pleasant with any in the world." The reports from our unhappy colony at Mesaurado, confirm this statement—and in the fevers of Batavia, of the East and West Indies, of the Islands on the coast of the Netherlands, and of certain parts of Italy, we are supplied with further illustrations of the fact.

Disease is produced by rains in other modes. They sometimes act by washing off, or mechanically destroying the green pellicle or coat, which lies on the surface of stagnant waters, excluding the sun, without whose influence miasmata cannot be emitted. On other occasions, they bring down effluvia raised by previous evaporation, and kept during droughts in the upper regions of the atmosphere. This effect is now and then to be seen in our own country, and is a very common one, along the African coast, and in some other sections of the world. Lind remarks, and which is fully confirmed by others, "that the first rains which fall in Guinea, are supposed to be most unhealthy, and that they have been known in forty-eight hours to render the leather of shoes quite mouldy and rotten." He further observes, "that woollen clothes wet in these rains, and afterwards hung up to dry in the sun, have sometimes become full of maggots in a few hours." The unfortunate Park says, "that the rain had not commenced three minutes before many of the soldiers were affected with vomiting—others fell asleep, and seemed as if intoxicated. I felt a strong inclination to sleep during the storm, and as soon as it was over, I fell asleep on the wet ground, though I used every exertion to keep myself awake.

The soldiers likewise fell asleep on their wet bundles." Twelve of them were ill the next day.

As relates to the distance at which miasmata may be transmitted in such a state as to excite their ordinary effects, no slight difference of sentiment prevails. This is a point which, perhaps, cannot be very precisely determined, though it would seem, that they are wafted by the winds, and in some instances, conveyed to a considerable distance. Little doubt can be entertained of this, since diseases, known to be produced by this cause, often occur in situations thus remote from the source of exhalations.

We have proof of a very strong character, to warrant the conclusion, that miasmata are carried, and do operate even at the distance of eight or ten miles. By Bancroft, I am aware, the sphere of their action is much more circumscribed even to half, and more commonly to a quarter of a mile. But this hypothesis seems to me to be contradicted, as well by the experience of our own climate, as that of other countries. What, for instance, becomes, on such a supposition, of the fact of the influence of the Pontine marshes, the nearest point of which is several miles, on the health of Rome? That, however, it may take place, there must be a moderate current of wind setting in the direction, and the mass of the exhalation very considerable. By a storm, or even a blast, they are usually dissipated. That such is the vehicle by which they are transmitted, is shewn by the circumstance of the diseases of which they are the cause, appearing in positions towards which the winds of the season are steadily directed. Thus, in most parts of the United States, during the autumnal months, the eastern side of our water courses is commonly sickly, while the opposite side is otherwise—and which is explained by the winds of this period coming from the south-west.

It is related by Lancisi, "that thirty gentlemen and ladies of the first rank in Rome, having made an excursion upon a party of pleasure, towards the mouth of the Tiber, the wind suddenly shifted, and blew from the south over the putrid marshes, when twenty-nine were immediately

seized with a tertian fever, one only escaping." In speaking of an English settlement on an Island near Borneo, Lind mentions, "that for a few months the people continued in perfect health. But no sooner did the *monsoon* change, than sickness made its appearance, and raged with such violence that scarce one in ten survived. The seasons of health and sickness are here regulated by the direction of the monsoon. During the north monsoon, from October till April, the wind comes from the sea, and the settlement is perfectly healthy. But from April till October, during the south-west monsoon, the wind blows over the marshes both of this Island and Borneo, and produces fevers of the most malignant nature."*

East winds seem generally, and most probably from their greater moisture entangling the miasmata, to be better vehicles for the transportation of such poisons. The fact is indisputable, that all odours are more pungent, and certain ones only become sensible, in fogs or humid states of the atmosphere. We are told, moreover, that "the east wind which blows from Essex towards London, invariably carries on the miasms from the former place, where they are freely generated, as all susceptible persons experience—and that this is not a mechanical effect of the motion of the air is certain, since the western winds do not transport them in the opposite direction. Nor will the east wind produce it, except in cases where it blows over countries subject to malaria—a proof that the poison is present, and that the effect is not a property of the wind itself."†

The same property of eastern winds has been remarked in the United States, though I am in possession of no facts so strikingly illustrative—and here and elsewhere, the influence of cold, dry, northerly winds, is known to be directly the contrary, lessening the power of miasmatic exhalation, or blowing it away altogether, as may be their force or duration, as is manifested in the decline, or entire suppression of diseases dependent on it.

It is to be recollected that the diffusion of malaria is much

* Lind, p. 75. † Edinburgh Review, No. LXXII. p. 542.

more limited over water, by which, probably, they are absorbed, or otherwise counteracted or destroyed. To this point great attention has recently been paid by Bancroft, the result of whose conclusive inquiries is, that a vessel may lie one quarter of a mile, or perhaps even nearer, to the most sickly shores, without endangering in the slightest degree the health of the crew.

In support of this conclusion he has accumulated much authentic testimony, some of the most striking of which I shall cite.

"In mentioning 'a quarter, and perhaps half of a mile,' as the greatest distance at which marsh effluvia seem capable of being conveyed, even under the most favourable circumstances, from their source, so as to produce disease, I have confined their morbid influence within much narrower limits than those which are generally described by medical writers, most of whom suppose marshes capable of exciting fever at the distance of several miles. It is to be regretted, that observations on this point have not been made, and reported with greater care and precision. Sir John Pringle, indeed, appears to have thought more justly on this subject, and after describing the epidemic marsh fever which raged in Zealand, both among the inhabitants and the British troops, in the year 1747, he adds, 'Commodore Mitchell's squadron, which lay all this time, at anchor, in the channel between South Beveland and the island of Walcheren, at both which places the epidemic prevailed, was neither afflicted with the fever nor the flux —but amidst all that sickness enjoyed perfect health.'* This immunity of the British seamen is, by the author, justly ascribed to their having been out of the reach of what he calls 'the moist and putrid air of the marshes,' though the whole width of the channel is, I believe, in general, but little more than *one* mile, and therefore the squadron could not, even at midway, be placed at more than half that distance from the grounds whence noxious

* Diseases of the Army, p. 57.

miasmata arose. Dr. Lind* notices this fact, and makes the following addition to it, viz. ‘when Commodore Long's squadron, in the months of July and August, 1744, lay off the mouth of the Tiber, it was observed that one or two of the ships, which lay *closest* to the shore, began to be affected by the pernicious vapour from the land, whilst some others, lying further out at sea, at but a very small distance from the former, had not a man sick—at the same time, the Austrian army, under the command of Prince Lobcowitz, suffered so great a sickness, through the proximity of their situation to the marshy country, that they were obliged to decamp.’

“Dr. Blane, also, observes, that ‘it is difficult to ascertain how far the influence of vapours from wood and marshes extends, but there is reason to think that it is to a *very small distance.* When ships watered at Rockfort, (Jamaica,) they found that if they anchored *close* to the shore, so as to smell the land air, the health of the men was affected, but upon removing two cables' length, no inconvenience was perceived.’†

“But the most decisive evidence on this subject has been obtained by the late expedition to Zealand. Drs. Blane, Lempriere, &c. in their report to the Secretary at War, dated Middleburg, October 10, 1809, and printed by order of the House of Commons, assert their ‘having *ascertained* that the crews of the vessels stationed in the very narrow channel (only a few yards‡ from the land) between Beve-

* On preserving the Health of Seamen, p. 69.

† Diseases of Seamen, p. 206.

‡ This expression of “a few yards,” is much too indefinite. In conversing on the subject afterwards with Dr. Blane, he appeared only to be certain that the vessels in question, or, at least many of them, were stationed at *less than a quarter of a mile* from the shore. According to the best information which I have been able to obtain, the ships of war at Flushing were anchored generally at about one quarter of a mile from the shore. Those in the Roompot channel at about three-fourths of a mile from the land. It was chiefly in the latter channel, and at about that distance from shore, that the transports having on board the cavalry, (viz. 2d Dragoon Guards, and 9th and 12th Light Dragoons,) were stationed.

land and Walcheren, have continued perfectly healthy the whole campaign—thus decidedly proving that the noxious exhalation is nearly confined to its original source.' Here it should be recollected, that it is stated in the same report, that 'the number of sick and convalescents, in the different hospitals, amounted to more than two-thirds of the total force,' *at that time*, 'notwithstanding about 1500 sick had been already sent home by different conveyances from Walcheren alone.'

"The general prevalence of health on board the ships of war and transports was also confirmed, on my enquiry at the Transport Office, by Mr. M'Leay, secretary, and Mr. Houseman, chief clerk of that department. Dr. Blane, also, had the goodness to communicate to me a letter from Captain Hanchett, who commanded the Raven Sloop of War, during the expedition against Zealand, and being wounded, had remained thirteen nights on shore, (for the cure of his wounds,) by which he contracted an obstinate intermittent. In his letter, dated Exeter, April 29th, 1801, Captain Hanchett writes as follows: 'The Raven, while I commanded her on the late expedition, was more *through the narrow channels* of Zealand, and more *in shore* than any other vessel, of any description, employed there—her station being that of the leading ship of the squadron in shore withal: and after the action of the 3d of August, I went up the narrow pass between Schowen and Goree, (within four miles of Williamstadt) laying not more than a *pistol shot* from that shore, and was the last down upon the retreat. There was, however, *no ague in the ship but mine*, which was, no doubt, occasioned by my wound—and, I believe, there were very few in the other vessels of Commodore Owen's squadron.' 'I had forgotten to mention that, during the time we were refitting at Ter Veere, the men had leave (to go) on shore, *but never staid the whole night;*

These did not land, and, consequently, did not partake of the sickness. Mr. Webb, Inspector of Hospitals, in his evidence at the House of Commons, asserts, that "the men who remained on board the ships were *extremely healthy*."

and, when laying off Schowen, they went on shore to bathe and watch, under the charge of the commissioned officer of each division, every evening at five o'clock; and after bathing, they ran races along the dykes for half an hour, but there was never any appearance of ague except in myself.'*

With such a mass of evidence before him, it is not a little astonishing that an acute and intelligent writer in an Edinburgh Journal, should lately have employed the following language.

"It is commonly held," says he, "that miasma cannot travel far from the place of its production—a fallacy often leading to very pernicious consequences. But the east wind has the power of transporting it to considerable distances, and we have little doubt that whenever it occurs in this city, (Edinburgh) where it now is rare, *the poison is transported from Holland!*"

Nor is it less ascertained that such effluvia rarely ascend to any considerable height. The experience of Lind, Pringle, Hunter and Bancroft, shews that this is so much the case, that in encampments in the most exposed positions, soldiers sleeping in the third story of barracks are comparatively little affected.

On this point, however, I cannot do better than use the facts which the industry of Bancroft has collected.

"Dr. Hunter, says,† 'the barracks at Spanish Town, consist of two floors, the first upon the ground, the second on the first. The difference in the health of the men on the two floors was so striking as to engage the attention of the assembly of the island, (of Jamaica,) and, upon investigation, it appeared that *three* were taken ill on the ground floor, for *one* on the other. The ground floor was not, therefore, used as a barrack afterwards.' A similar fact occurred at St. Anne's barracks, in Barbadoes, between the 27th July and 20th of August, 1805, when two hundred and seventy-eight men of the 15th regiment of foot, then

* Bancroft on Fever. † Diseases of the Army in Jamaica, p. 306.

very lately arrived from England, were attacked by the Yellow Fever, of whom seventy-seven died. These men chiefly occupied the barrack which runs towards the sea, and is nearly at right angles with the officers' or *stone* barrack, and has '*low wet ground on each side*.'* In this barrack the men on the lower floor were 'taken ill in the ratio of *three to one*, of those on the upper floor.' This statement I have taken from a report made to Dr. C. Ker, then Inspector of Hospitals in the West Indies, by Mr. Major Carroll, Surgeon to the Forces, under whose care the sick in question were placed; which report was dated Barbadoes, 10th of September, 1805, and a copy of it put into my hands, by the writer, in November, 1806.

"Whether similar differences occur in all climates between the ground floor, and the next above, in regard to the influence of marsh miasmata, I cannot determine. I believe that the former are, in this respect, every where, much more unwholesome than the latter. Sir John Pringle, after mentioning the prevalence of intermitting and remitting fevers at Ghent, and still more at Bruges, in the summer and autumn of 1742, adds, 'it was then observed that such as lay in the upper stories, were much more healthy, than those who were below in the ground floors, which were all very damp.'† The same ill effect upon the *ground* floors was experienced during the late expedition to Walcheren, and, therefore, Drs. Blane, Lempriere, &c. in their report to the Secretary at War, lately mentioned, say, 'on no account should ground *floors* be used as *sleeping* apartments. The more lofty the buildings the better—for the tenants of the upper stories, not only enjoy the best health, but when taken ill, have the disease in the mildest form; an instance of which came under our observation when we visited Fort Ramakins, and the same is confirmed by the

* Dr. Chisholm, alluding to this part of Barbadoes, observes, that, "the eastern side, where Constitution Hill is situated, and where the king's-house and an extensive barrack stand, is thought to be affected by *marshy miasm*, from a branch of the sea, which runs a considerable way into the country."—Essay on Malignant Pestilential Fever, &c. vol. 2, 160.

† Diseases of the Army, p. 13.

experience of the natives.' When the small elevation of a single story (not exceeding twenty feet) from the ground, is found so greatly to diminish the power of noxious exhalations, it might be expected that the tops of hills rising a few hundred feet above the level of the sea, or of the surrounding country, would always be found healthy. Experience has, however, often proved the contrary, particularly on the *Morne-fortuné* at St. Lucie, and on the Hospital, and Richmond Hills, at Grenada, where very great mortality has repeatedly occurred among British soldiers. But in these and similar cases it seems probable that the soil, at or near the tops of these hills, contained matters suited to the formation of marsh miasmata, with sufficient proportions of clay to retain the necessary moisture. There can, indeed, be no doubt, that this is the case of the *Morne-fortuné*, which I observed to be very wet, and, in some degree, swampy. This and Richmond Hill, being at their tops more than seven hundred feet above the level of the sea, could not, I am persuaded, be so greatly affected merely by exhalations from any *low* and damp grounds in their neighbourhood."

Yet high grounds are occasionally subject to autumnal diseases, where they are not the source of miasmata, provided they are situated under the lee of marshy or low lands. It does indeed happen that the latter places sometimes entirely escape disease, as I have had many opportunities of observing. The same remark is made by Sir Gilbert Blane, who adduces in confirmation of it, several very unequivocal facts, which he explains by supposing, "that the water exhaled from the low surface, has a tendency to ascend, and with the miasmata it envelopes, being lifted over parts on the same level, impinges on the neighbouring heights"—all which is perfectly consistent with the phenomena of fogs and clouds.

Nevertheless, whatever interrupts the stream of wind charged with this poison, as an elevated hill, or wall, or a forest, will commonly arrest these exhalations, and hence the custom, in certain places, of planting rows of

trees between the immediate spot of residence and the source of danger. By this simple expedient, which is now very commonly adopted, many situations in the United States, formerly sickly, have been rendered free from miasmatic diseases. It is indeed said by a respectable writer, that by merely placing gauze against open windows, or sleeping under musquito nets, protection is derived against noxious exhalations, which, to a certain extent, may be true, and is credited by the inhabitants of our southern states.

As might be expected from the preceding statement, the clearing away of woods in miasmatic positions, by withdrawing the screen which they afford, is mischievous. De Lisle supplies us with many examples of it, among which the following are the most conspicuous. "Near St. Stephano," says he, "on Mount Argental, a convent is situated, once celebrated for its salubrity, which, since the surrounding forests were removed, has become very unhealthy—and at Valletri, near the Pontine marshes, the clearing of an interposing wood occasioned immediately, and for three successive years, the most destructive febrile diseases. It is the opinion of Sir Charles Morgan that the sickliness of Rome is partly to be imputed to the cutting away of the forests in the vicinity, which in his pecuniary distress was done by Pope Pius the Sixth: and by a late writer it is conjectured that a conviction of their salubrious effects induced the ancients to consecrate them to Neptune, in order by the force of religious obligation they might be preserved sacred.* Numerous instances of the same kind might be had from the works of Lancisi, Donas, Volney, &c. &c. But it is not necessary, since the fact is so fully established by the experience of our own country.

How long the system will remain under the impression of malaria without having some complaint excited, is not clearly determined. Though days usually elapse, it has occurred in a very few hours.

* Quarterly Review, No. LIX.

"The atmosphere," says Ferguson, "of certain marshes of Antigua, was so actively pestiferous, that it often occurred to a well seasoned soldier mounting the night guard in perfect health, to be seized with furious delirium while standing sentry, and to expire with all the horrors of black vomit within less than thirty hours from the attack."*

Not a few facts, of a similar kind, are to be met with in the writings on tropical diseases, and especially as happening to watering parties from ships, who delayed on shore till the setting in of night. "I have," says Lind, "known a whole boat's crew seized the next morning with bad fevers"—and further remarks, "from comparing many instances of people who have slept on shore during the sickly season, and in consequence of it, who alone have been taken ill out of the whole ship's company, then lying in an open road, it appears that some are immediately seized with sickness, or delirium—many are not seized with either till they have been on board two or three days—several have been only slightly indisposed for the first four or five days, and in a few, the symptoms of indisposition have not appeared before the tenth or twelfth day."†

On the whole, however, he considers such instances as rare, and though attacks from exposure to miasmata, not unfrequently take place in four or five days, they are more generally postponed till the ninth, tenth, or fifteenth day, even in the most malignant and concentrated state, as at Batavia, Gambia, Monilla, St. Thomas, &c. &c.

It is the opinion of the venerable Jackson, which is not without support, that these attacks are apt to observe *septenary periods*, seldom occur before the seventh day, commonly on the fourteenth, and in many instances not earlier than weeks or months, though the cause of the disease during this period be in great activity.‡

On other occasions we are taught to believe that they

* Ferguson on Marsh Poison, p. 12.

† Lind on Preserving the Health of Seamen, p. 78.

‡ Jackson's Outlines of Fever, p. 248.

have continued in a passive state for several weeks. The time, indeed, has been extended even to six or eight months, by some of our most respectable writers. We are told expressly by Bancroft, and in which he is supported by Jackson and Ferguson, that this very often happens, provided there be an intervention of winter—the action of such effluvia being suspended by cold. That it is true, my own experience satisfies me, having frequently seen individuals so exposed at the close of autumn, sickening in the ensuing spring—and which, perhaps, affords the only explanation of vernal intermittents and other unseasonable bilious affections. The period I have indeed known to be extended to a twelvemonth.

It has already been intimated that moisture promotes the operation of miasmata, and it appears that their noxious power is vastly increased during the night. This was strongly asserted by Lancisi, who cites a variety of facts and authorities in support of the conclusion. He particularly admonishes those who travel over the Pontine marshes in summer, not to do it after dark, as was a common practice, to avoid the heat of the day. The same injunctions are still given to strangers, and all experience confirms the danger of such nocturnal exposures.

Entangled in the dew, the miasmata, previously elevated, are precipitated with it at this time, and come into operation. The experiments of De Lisle, before noticed, shew, independently of other evidence, their comparative levity. Be the explanation, however, what it may, the fact of the pernicious effects of dews is fully established. The experience of our own miasmatic districts, may be cited in support of it, and indeed so aware of it are the inhabitants of such places, that every precaution to avoid their influence is practised. As to our yellow fever, it is well known that it is infinitely more hazardous to visit the infected portions of the city after night: and there is a common impression, probably correct, that the liability to take the disease is lessened by retreating early in the evening into houses, with closed doors and windows, and especially by sleeping in

upper rooms. The same has been remarked elsewhere, with regard to pestilential diseases—and so thoroughly are the Turks convinced of the efficacy of measures of this sort in plague, that they are enforced by the municipal regulations of some of their cities.

But to cite more positive evidence to the point:—"The evening dew," says De Lisle, "is so much dreaded at Rome from the proximity of the Pontine marshes, that as soon as it begins to be perceived, all the inhabitants shut themselves up in their houses. But the moment the first copious precipitation of vapour which accompanies the close of a hot day is over, they all sally forth again, and the streets are more crowded than ever."

In the treatise of Johnson on the diseases of tropical climates, not less distinguished by research than eloquence of style, the following, among other facts is stated. "Having occasion," he says, "to take passage from Madras to Calcutta, in a foreign merchantman, at that time, I sat late on deck one evening after our arrival in the Ganges, the vessel being at anchor a mile from the shore, and not a breath of wind moving in any direction. As the dews began to fall, I perceived, all at once, a faint, heavy odour, to account for which I was much puzzled, as there was no breeze to waft any exhalation from the adjacent shores. My reflections were soon interrupted, however, by a sense of faintness, giddiness, and at length nausea, with which I was suddenly affected. I immediately went below, not a little alarmed, and fully persuaded that I was seized with the fever whose effects I had so much reason to dread. On drinking some warm water to clear my stomach, I took a dose of calomel and opium, and next morning, castor oil. Although no farther symptoms of fever occurred, yet I felt an unusual degree of lassitude and depression of spirits for some days after I got to Calcutta."

Bancroft, with his usual industry, has collected much testimony to the same purport, of which, I cannot refuse to avail myself, though already so largely indebted to his work.

" In the instance of the Phenix ship of war, 'none of those who *slept* on shore escaped the sickness, and only three of them survived it'—and that, though nearly all the rest of her crew, consisting of two hundred and eighty men, went, in parties of twenty or thirty, at different times, on shore in the day, and 'rambled about the island hunting and shooting'—'bartering for provisions, washing linen,' &c. 'not one of those who returned to the ship at night was taken ill, or suffered even the slightest indisposition.' Exactly similar effects occurred the following year, with the same ship at the same place, where 'she lost eight men out of ten, who had imprudently remained *all night on shore*' —whilst the rest of the ship's company, 'who, after spending the greatest part of the day on shore, always returned to their ship before night,' 'continued in perfect health.' In like manner the crew of the Hound Sloop of War, (then in company with the Phenix,) by never sleeping on shore, continued in good health. In the cases of the Ponsborne and Nottingham East Indiamen, those who had slept on shore were exclusively attacked by the fever —and, in particular, 'the carpenter (of the Ponsborne) and his crew, nine in number, by their all *sleeping* on shore, catched the fever, and died, except one, who was a negro.' The effects were exactly similar in the cases mentioned by Drs. Clark and Trotter, and in that of Fontana. Dr. Lind has, moreover, in different places, mentioned other instances of similar morbid effects, resulting from exposure to marsh effluvia *by night*, and the like has been done by Dr. Blane, Dr. John Hunter, &c. &c."

In conclusion, I have only to remark, that though much is to be imputed, under such circumstances, to the precipitation of the miasmata—that we are also to take into consideration the greater susceptibility of the system, in the coolness of night, and in a state of sleep, by which their action is promoted.

It appears that habit has, in no slight degree, a tendency to reconcile the system to the impression of miasmata, and consequently, to lessen their influence. New comers

into the sickly portions of our southern states, are confessedly, more apt to take the complaints of the warm season, than the inhabitants. As respects one shape of endemical fever, caused by these exhalations, there is indeed an entire exemption on the part of the permanent settlers. The same has been remarked by writers on the diseases of the East and West Indies—by whom, we are further told, that if an inhabitant be attacked, the case is comparatively slight, and of easy management. It is by this loss of susceptibility that we become *acclimated.*

Nor in this particular, does there seem to be any difference in the more temperate climates of Europe. Thus we are informed that "the labourers who came down in the harvest time into the Campana, Modena, Ferrara, Bresse, &c. where the rice grounds and marshy districts are principally situated, are most frequently attacked with the fever, even when the season is considered favourable to the natives." In the expedition to Walcheren, a similar observation was made—and furthermore, that strangers were variously affected, according to the district whence they came. It was found, for instance, that such of the British troops, as were natives of mountainous countries and dry soils, were oftener affected than those from low and damp situations—and that strangers surviving the first attack, became subsequently less liable to the disease.

In a memoir by General Monnet, who commanded the garrison in Flushing for seven years, on the Preservation of the health of his soldiers, it is recommended that they should not frequently be changed, having ascertained that new regiments suffered severely, and that by the third season, becoming habituated to the malaria of the place, (*acclimaté*) they scarcely experienced any sickness.*

There is, indeed, ground to suspect, that the system, under certain circumstances, becomes ultimately so familiarized to the action of miasmata, that they constitute, in some degree, one of the stimuli by which life is sustained.

* Quarterly Review for 1824.

It is alleged, and so confidently as to claim attention, that old persons, who have, during a series of years, been exposed to the influence of such exhalations, very soon languish and die, upon a removal to a more healthy position. Whether this be so, I am not prepared from any experience of my own, either to aver, or deny. But it rests on good authority,* and is not destitute of the support of some analogies. Many stimuli, which, though in the commencement are highly baneful, cannot, after we are accustomed to them, be withdrawn, without serious, and sometimes fatal consequences. Of this law of the animal economy, we have conspicuous exemplifications in the use of opium, ardent liquors, and tobacco. Extraneous stimuli, it has been observed in these cases, like aliens in our country, would seem, after a time, to become so completely assimilated and naturalized, as to lose many or all of their peculiarities and distinctions.

In their operation, marsh effluvia are very wide and pervading. No section of the body escapes—and hence the number and diversity of epidemical and other diseases, of which they are the source.

Every variety and gradation of bilious fever, whether intermittent or remittent, or continued—inflammatory or typhoid, or malignant—as well as the several forms of intestinal disorder, cholera, dysentery, and diarrhœa, are, for the most part, distinctly to be traced to such influence.

The annals of our science abound with notices of the most malignant epidemics, from the extent and concentration of marsh exhalations. Fracastorious ascribes such a disease, which prevailed most destructively, to an extraordinary inundation of the Po, which happening in the spring, infected the air throughout the summer. Even from the putrefaction of water only, says Forestus, the city of Delft was scarcely ten years free from some description of pestilence.†

It is remarked by Pringle, that though the heat was great,

* Rush. † Obs. Lib. VI.

the troops in the Netherlands remained healthy till they were cantoned in the marshes, when violent intermittent and remittent fevers, and fluxes, became general. The fatal expedition of the British to the Island of Walcheren, supplies us with most irrefragable evidence of the same kind—and indeed, did the point require further illustration, we might appeal to the history of nearly every country, and particularly our own.

The Egyptian plague itself, has, by some of the modern writers, been imputed to the periodical overflowing of the Nile, leaving the adjacent Delta in a marshy condition.

This hypothesis derives support from several considerations. The disease is found to suceeed that event so uniformly, and in every way is so intimately connected with it, as to present the appearance of cause and effect. Like other miasmatic fevers, it also exhibits various types and modifications. This is admitted by Sir James M'Gregor, who is among the most distinguished of the modern contagionists. In the Indian army, he observes, that when the plague first broke out, the cases sent from the crowded hospitals of the sixty-first and eighty-eighth regiments, were, from the commencement, attended with low or typhous symptoms—those from the Bengal volunteer battalion and other corps, encamped near the marshy ground at El-Hammed, were all of the intermittent or remittent character—and such as occurred in the cold rainy months, had much of inflammatory diathesis—while at the close of the season, at Cairo, Ghiza, Borluc, and on crossing the isthmus of Suez, the disease assumed the shape of a mild continued fever. The analogy holds in another respect. It is stated by Baron Larry, that the disease increased or diminished according to the direction of the wind, wafting the malaria to or from the encampments, or as they were accumulated or dispersed.

Notwithstanding what I have said, are we warranted by indisputable evidence, in considering so large a number of diseases, differing as they do very widely in appearance and character, as proceeding from one common cause—or in

other words, are miasmata always the same, as well in their nature as the degree of power?

No one is more fully persuaded than myself, of the vanity of attempting to give a satisfactory answer to this question, in the present state of our knowledge. Yet I cannot help expressing my belief, that in the process of putrefaction, or otherwise, a poison is elaborated under different circumstances, of gradations of strength, as well as differing in kind.

It is indeed hardly possible to conceive how much the results of vegetable decomposition may vary. We find in the same season, all the divers forms of disease, which I have just enumerated, proceeding from modifications of effluvia. There is here, probably, no other material variation, than as regards the degree of intensity. But in some instances the miasm seems totally different, as the malaria of some parts of Italy, the exhalations from the swamps of Batavia, and of several other sections of the eastern world, and I may add, of our own country, producing diseases of a peculiar character, and singular violence. My allusion is to a species of *malaria*, which is generated in certain places in our Western States, of limited extent, as on the margin of Cumberland and the Miami rivers.*

* In the second and fourth volumes of the Philadelphia Medical Journal, will be found several accounts of this malaria, and its effects. The following extract from one of these papers will serve to afford some general information concerning it:

"It has been found that the poison, whatever may be its nature, is confined to certain spots at or near the foot of the mountain, in those coves which have a western or north-western aspect. Those which open and look to the south are free from it. The existence of the poison is of periodical occurrence, continuing from June to October. No cases of poisoning from this source have been observed, before or after these periods. It appears, also, to have greater virulence in August and September, than earlier or later.

"If cattle remain on those contaminated grounds during the night, or seek them early for their morning food, they always suffer more or less from the poison. But after the sun has risen, so as to dissipate the dews, they feed in those places with perfect safety. With the knowledge of this fact, many of the farmers were in the habit of *penning* their stock at night, and until nine or ten o'clock in the morning, when they were turned

Even admitting miasmata to be composed of the same elements, these, in different states of combination, will be productive of very different results. Chemically unite, in several proportions, oxygen and azote, and we have, as results atmospheric air, nitrous oxide, nitrous and nitric acid. What indeed can be more opposite than the mild air we breathe, and aqua fortis, consisting of similar constituents? By brewing and distillation, liquors are educed from the same materials, differing essentially in their properties and effects. When results so diversified, are attained by such artificial means, how can we deny to the chemistry of nature, the power of eliciting every variety of miasm.

The difference of structure and predisposition in the parts, where these diseases are located, will afford, per-

out to range, without the hazard of poisoning. But within a few years, a fence has been extended for many miles along the foot of the mountain, so as to exclude this nuisance—in consequence of which, cases are of much more rare occurrence than formerly.

"The depredations of this insidious enemy are not, however, confined to the cattle. Not a few of the inhabitants have been its victims. Generally those who have suffered from the cause, are supposed to have been injured by the flesh, milk, or butter of the animals, that had previously taken this deleterious agent, and in which it had not manifested itself with sufficient violence to attract attention. Hence the popular name of the disease.

"That such is the origin of this affection I have some reason to doubt—though, so strong is common opinion to this effect, that it may seem to argue no little scepticism to call it into question. This, however, should not shield error from scrutiny. It certainly affords a most curious and interesting subject for speculation. But, be this as it may, there is less uncertainty on another point. Men may be infected as other animals by similar exposure. Lying on the ground, in the poisonous tracts, or remaining there for several hours during the night, is always followed by an attack of this disease, which has occasionally been fatal.

"In men, the disease thus induced is a gastritis, with some modification of the usual symptoms accompanying this infection, as produced by miasmata generally. The stomach is extremely irritable, the bowels torpid and obstinately costive, with great febrile excitement and determination to the head. There is also a peculiar odour emanating from a patient labouring under this disease, more especially as death approaches, which is, perhaps, the most striking diagnostic. But for this, it might sometimes be more difficult to distinguish it from the more violent attacks of bilious remittent fever."—*Lea on Milk Sick.*

haps, as relates to some of them, an explanation of the variations in their character and aspect. Though it may account for the peculiarities of the bowel affections, as distinguished from those of the blood-vessels, it will not at all, for the wide discrepancies in the case of fevers. These are situated in the same parts, and were they owing to an entire identity of cause, would present similar phenomena, or the same description of disease. But surely there are no two morbid affections, which have fewer points of resemblance, than a case of mild intermittent, and of a malignant fever!

Nevertheless, it must be conceded that it sometimes happens, under apparently the same circumstances of exposure, that nearly all the cases I have enumerated will occur, and within very narrow limits. Thus, during the two last seasons, I have seen in the same settlement—I might almost say in the same family—the several species of autumnal fever, as well as the bowel affections. Most of these diseases are so nearly allied to each other that they may be induced by the same cause, invited to different parts of the system in the way before suggested. Yet it is still true, and which was strikingly illustrated in our last sickness, that in the commencement we shall have intermittents—next remittents—then continued fever of different gradations of violence—and finally, perhaps, a change to dysentery. Nor is it less curious that the whole of these diseases may prevail at the same time, in different positions very near to each other, where, though there be no obvious cause, the miasmata are modified by some local peculiarities. Thus, the summer before last, we had very malignant intermittents on the banks of the Schuylkill—continued fever of a typhoid character at Germantown—and dysentery at Frankford—these places being within the same vicinage.*

* In the following extract from Alibert on Intermittents, we have a very fine illustration of the variations of effect, from perhaps the difference of dose of the malaria, and predisposition in the several individuals.

"Twenty-eight soldiers from the garrison of Mourne-Fortune had obtained permission to go and work for two planters who were clearing the

Connected with this obscure subject, there is a fact deduced from my own observations, and which I find in part corroborated by a late writer of great respectability, that may shed some light on it.* The nature of miasmata, I think, is most materially influenced by the condition of the surface of the earth, from which they are eliminated. When thoroughly wet, effluvia are generated, productive of gastric and intestinal disorder—when merely moist, of intermittents and ordinary bilious fevers—and when so dry as to crack, there escapes through the interstices a subterraneous miasm of a more envenomed character, inducing sometimes even pestilential diseases. It may be stated generally, without entering into details, for which I have not, at present, space sufficient, in confirmation of these views, that early in July, when our pools and other receptacles of stagnant water are still full from the rains of spring, and the surface of the earth damp, we have cholera morbus—next, intermittents and mild remittents, and continued bilious fever, which progressively assumes a graver character. Towards the close of autumn, when such a condition of things is renewed, by the rains of the season,

land in a very humid and marshy situation, called *grande cul-de-sac*. They had undertaken to complete a certain piece of work for a given sum, and their eagerness to finish it, induced them to labour with a degree of ardour and intensity beyond their strength, and that without considering the danger to which they were exposed. In less than a week these twenty-eight soldiers were without a single exception, carried to the hospital. Three of them died, in a very few days, of *cholera morbus*—five of dysentery, which was accompanied even till death with the most excruciating tormina—four were carried off by an adynamic fever, in which the whole body, having become yellow, emitted such an offensive smell, that no one could approach their beds without suspending his respiration, The others, after suffering attacks, more or less severe, of malignant fever, at length recovered, but their convalescence was tedious, and their health not completely restored till they had recourse to the use of mineral waters. The report which M. Cassan made respecting this melancholy event, had the effect of having an ordinance immediately passed, by which the soldiers were prohibited from labouring any more for the inhabitants of the island."

* Ferguson on Marsh Poison.

there is a return of these diseases, and mostly in the same order. No doubt, however, in the modification of miasmata, much depends on the state of the vegetable mass—composition of the soil—the degree of heat—the confinement of the position—and other circumstances which control the process, and give to the products greater virulency by concentration, or otherwise.

That malaria may be generated subterraneously, or at least, confined under the surface of the earth, is clearly demonstrated. We have proofs of it, in our cities, in the filling up of wharves, of brick ponds, and other hollows, in the levelling of streets, as well as on our great water courses, by alluvial depositions, which are well known to be productive of disease, with a superficies perfectly dry and indurated. In how many instances, too, have the same consequences been traced to the draining of pools, and to the banks of rivers previously overflowed, left in a similar condition. Evidence of the most irresistible kind, on this point, is collected by Ferguson in his tract on marsh poison. Even large sections of country, in such a state, are shewn to emit malaria—and this is singularly the case in the territory of Maremma, in Italy, an elevated, dry and volcanic district, which extends from Leghorn to Terracinna, from thirty to forty miles wide and in length about two hundred miles, where, on the authority of Professor Koreff, we learn that miasmatic fevers constantly prevail. As the fact, however, is notorious, and perhaps now generally conceded, I shall withhold any further illustrations of it. Yet I cannot forbear to mention, as affording the strongest confirmation, that it has often happened in our southern states, that the turning up of the earth of new fields, in the operations of agriculture, has been followed by sickness, from the escape of exhalations. It is observed by M. Cassan, that within the torrid zone, "the cutting of ditches, or opening the ground for the first time by the plough or hoe, is peculiarly injurious."* Throughout the West Indies, it would seem, indeed, to be

* Alibert on Intermittents.

a popular notion, that soil recently exposed, lets loose some pestilential quality.* The correction of this evil, says a writer to whom I have often referred, "must be found in the powers of cultivation, ever opening the surface, for the escape of pestilential gases, and exhausting the morbific principle by a constant succession of crops."†

Nor is it perhaps less satisfactorily determined, that in many instances, where autumnal diseases have appeared, on rains succeeding to droughts, in positions entirely free of vegetable decay, and other obvious morbific sources, that malaria has been evolved, in the process which takes place by the moistening of the surface of the earth. I have already slightly presented this view of the subject, with some facts to sustain it, and may again recur to it in the progress of this inquiry.

I will now only add, that malaria thus generated, is often of a very active character, proving the cause of violent and wide spread disease.

(*To be continued.*)

* Williamson's History of North Carolina

† Ferguson on Marsh Poison.

CASES.

Art. VII. ***An Operation of Tracheotomy.*** **By Henry S. Waterhouse, of Franklin County, New York.**

WITHIN a few months, I have been informed of three cases in which death was produced by the introduction of foreign bodies into the trachea. In one case death ensued in thirty days from the accident, and in another the termination was delayed for something more than three months. A case occurred in Vermont, sometime since, where death followed the introduction of a plumb-stone in ten days. Another case occurred in Monston, Vermont, where a bean was drawn into the trachea, and it was removed by Dr. D. Stone, in opposition to the advice and remonstrances of friends and physicians. After making the opening, he was obliged to wait until an ingenious mechanic constructed a long, slender forceps, of soft iron. These Dr. S. shaped until he was enabled to reach the bean and grasp it fairly.

Several successful operations are recorded in the periodical papers, to which it is unnecessary to make particular reference. With a hope of increasing the confidence of surgeons relative to the importance and safety of this operation, I subjoin an instance falling under my own care.

A very promising child aged seventeen months, daughter to Mr. N. H. R. of Parishville, while eating some watermelon on the 3d of August, 1821, drew one of the seeds into her windpipe. The immediate consequences were coughing, strangling, and convulsive efforts, and these symptoms continuing in a very alarming degree for several days, the parents consulted various physicians. The physicians concurred in advising the operation if the seed was not speedily discharged.

During the months of September and October, the child suffered every thing short of actual strangulation. At times

its breathing was inexpressibly agonizing, and the strangulation seemed to be produced by the seed being thrown into the vicinity of the glottis by the cough. The periods of greatest distress in breathing were always succeeded by fits of coughing. The relief was immediate on the cessation of the cough. In the earlier periods of this case, hours were sometimes passed with the respiration free, easy, and apparently natural. Yet it was not uncommon for the child to be suddenly awaked from a quiet sleep by all the distressing symptoms, and the parents had become so well acquainted with the symptoms that they could designate the precise moment when the seed descended from the rima glottidis.

The condition of the child daily grew worse. The trachea and bronchiæ were becoming inflamed, notwithstanding the softness and smoothness of the watermelon seed. Cough and quick breathing, hot skin, and frequent pulse supervened. In addition to the distress produced by the irritation, there was every appearance of the inflammatory stage of phthisis pulmonalis. The patient was rapidly emaciated, and her strength was failing.

Early in the month of November the attacks of coughing and strangling had become alarmingly frequent. The cough was almost incessant. It was evident that life must soon cease, unless the cause of the irritation was removed.

I saw the patient for the first time on the 14th November. There would be no doubt of the propriety, and, indeed, the absolute necessity, of opening the windpipe to extract the seed. As the child was then easier in consequence of the employment of antiphlogistic remedies, the operation was delayed until the following morning. In the mean time we explained to the parents the true character of the operation, and obtained their full consent to the performance of it.

We placed the child in the usual posture, on a table, with the head thrown slightly back, and the neck somewhat stretched over a roll of cloth, securing her body and limbs by the help of assistants. We had no choice as to the place of operating, for the distance from the angle formed by the

meeting of the skin of the chin with that of the neck, and the upper extremity of the sternum, was only one inch. Of course there was no necessity for making the external incision much over one inch in length, commencing at the angle before mentioned. Notwithstanding the emaciation and softening of the muscles by the long continued irritation, the trachea was found to be at least three-fourths of an inch from the surface. The hemorrhage was dreadful, nor was it possible to avoid it. The very limited space for operating in, and the great depth to which the incision was continued, rendered it utterly impossible to shun parts that, in a neck of common length and leanness, might have been avoided with perfect ease. As the object was not merely to puncture the trachea, but to make an *opening*, through which an extraneous body might be searched for and removed, or pushed through the glottis above, we were absolutely compelled to cut through all the parts falling in our way. In addition to this, the violent and persevering struggling, screaming, coughing and strangling of the child, (altogether too young to be reasoned with) added in no small degree to the embarrassment of the operation.

It was impossible to use ligatures, as the bleeding was from innumerable minute vessels. Compression with a sponge was our only resource, and this was merely palliative.

By the time the incision was made down to the trachea the hemorrhage was truly appalling. Dr. M'Chesney, who had thus far performed the operation, desired me to complete it. After emptying the incision by the sponge, I was enabled to place the point of the knife on the space between the thyroid and cricoid cartilages, but did not until the third attempt succeed in making the desired opening. The blood flowed so rapidly that I was obliged after every attempt, to stop and use the sponge. I then introduced the extremity of a probe-pointed bistoury, and extended the opening downward the requisite length. By this time, however, the struggles of the little sufferer had ceased, and life had become to all appearance extinct. It is impossible for me

to depict the horrors of the scene. Our patient seemed to have fallen a victim to our well meant efforts to relieve it from a fate no less certain, but of a more lingering character. I passed a catheter through the opening, and endeavoured, though utterly in vain, to inflate the lungs. Dr. Sprague proposed to suspend the child by the heels, to facilitate the descent of fluids from the lungs. To this suggestion we readily assented, and while held in this posture, Dr. Parker made repeated pressure with his open hand on the abdomen, holding the other on its back so as to imitate as nearly as possible the act of respiration. A considerable quantity of blood with much bloody froth and mucus, was discharged by the mouth and the opening in the throat. We again laid the subject on the table. The seed appeared at the opening, brought along by the descent of fluids from the lungs, and was taken out with perfect ease with the fingers.

After repeated and persevering efforts to renew the respiration, we discovered some faint symptoms of returning animation. It was, however, an hour from the appearance of the first signs of resuscitation, until the patient breathed with apparent ease and regularity. We then gave her some fluid nourishment, and concluded the operation by drawing together the sides of the wound with strips of adhesive plaster covered with lint, and secured by a bandage. On the fifth day the adhesive plaster gave way, and the wound opened to its full extent—it was again secured by sticking plaster, and healed, though slowly, without any untoward circumstance.

Whenever the lint was removed, air passed with considerable freedom through the opening as late as the seventh day after the operation. About the 23d of the following month, being in the vicinity, I called to examine the child. The wound was perfectly healed. The cough and difficulty of breathing never returned after the removal of the seed, and though the countenance continued pale, in every other respect the health was entirely restored.

Art. VIII. *Case of Fractured Skull successfully Trephined.* By Dr. Andrew Park, of Eaton, Georgia.

THE patient whose case is here described, was knocked down by a blow given with the butt of a fowling piece, while he was in a state of intoxication. He was immediately raised in an apparently lifeless condition, though in a few minutes after, he revived sufficiently to make several exclamations. He soon relapsed into a state of insensibility, and remained thus until he was visited by Dr. Cotchings, Dr. Branham and myself.

He lay without sense or voluntary motion, and could not be excited—blood flowed from his mouth and nose—the pupils were slightly contracted, but were not perceptibly affected by the approach of a lighted candle—the pulse rather full and slow—the respiration stertorous and difficult. His right side was paralyzed—the left arm and leg were thrown about involuntarily, and the left hand was sometimes carried to the crown of his head, where there was a considerable swelling and a loss of the hair and cuticle, for about two inches and a half in diameter. He had been bled before our arrival.

Finding no other marks of external injury, and attributing the appearances to the previous intoxication, we were induced to believe that there was no depression of the skull. He was again bled, and the family were instructed to send for me early in the morning, if the unfavourable symptoms still continued.

It seemed to me, however, that the brain was suffering from compression, because the patient had spoken shortly after receiving the blow, and had gradually sunk into the insensible condition. This opinion I stated to Dr. Branham as we were returning home. Although a messenger arrived the following day at eleven A. M. to let me know that the patient was growing worse, it was not in my power to see him until three P. M. of that day.

I found him in a dreadful condition, his breathing had become laborious and snorting—the whole body was covered with a cold clammy sweat—his extremities were cold. The pulse was frequent, small, and thread-like, and the fæces and urine were passed involuntarily.

The danger was imminent, and the relatives of the patient importunate that no means should be left untried for his relief. He was placed on a table, and an incision made in the direction of the sagittal suture, through the bruised part before mentioned, for about four inches in length. After removing the pericranium, a capillary fracture was discovered, and a circle was removed from the skull by the trephine. We were very much disturbed to find no trace of effusion at this point. As there was but one blow inflicted, Dr. C. suggested that we should apply the trephine on the opposite side. I made a second incision at right angles with the first, about four inches and a half long, parallel to the coronal suture. By denuding the bones throughout the extent of this incision, we were satisfied that this part had sustained the greatest violence, and the fracture was very evident, the bones being widely separate. The trephine was reapplied, and a piece of bone removed from near the temporal and parietal bones, over the middle artery of the dura mater. A very thick stratum of black, firmly coagulated blood was now visible. After a considerable quantity had been discharged, I introduced the whole of my little finger, and found that the dura mater was separated in every direction for more than an inch. By the aid of my fingers and a probe I evacuated a very large quantity of clotted blood, and his head was subsequently so placed as to favour the discharge of the more fluid parts. Much blood, mixed with clots, came away, and in half an hour the brain was found to be elevated.

We were now terrified to discover that there was an extensive laceration of the dura mater, and that a small portion of the brain was protruded. When the probe was passed under the lacerated membrane, and the substance of the brain was touched, the patient was affected with univer-

sal convulsive tremors. We were now almost sure that the case would soon end fatally, and therefore satisfied ourselves with drawing the edges of the wound together by means of sutures, expecting that death would soon render further care unnecessary. He was now put to bed, and in a short time his pulse became fuller and more natural—the respiration easier—and he lay during the night like one in a quiet sleep.

On the morning of the 28th he was still speechless and motionless—I bled him, and ordered for him an active cathartic as soon as he could swallow. The room was darkened, and directions were given to keep him on a very light diet, and to bleed him, should any increased excitement render it necessary. On the 29th I found him feverish, and learned from the family that he had, for the first time, about twelve o'clock the preceding night, made a muttering noise, but without any distinct articulation. He tried to give me his hand, making several incoherent and vague expressions. The excretions were still passed involuntarily: he was again bled largely, and ℈j of calomel administered, to be aided by the use of salts and enemata. The discharge of blood and serum from the opening through the skull, was very abundant—new dressings were applied, and a strict adherence to the regimen above mentioned enjoined. I left him under the apprehension of his perishing from inflammation of the brain, notwithstanding the most prominent symptoms of danger were removed.

On the first of January he had not much fever, though the medicine had operated imperfectly—he had been bled by Dr. Cotchings. His mind still wandered, and the voluntary motions had become more perfect—said he thought he knew me, and frequently called for water. The discharge of matter from the head was very copious. On the fifth he was much better, but gave occasionally evidence of mental aberration—his memory was very imperfect, and his words often improperly applied. The wound was of a healthy appearance—the discharge from the head was still abundant. On the fifteenth I made my last visit—he was

much better—had regained, in a considerable degree, the power of voluntary motion—could sit up—get in and out of bed without assistance—sit in a chair by the fire, and walk the room. The motions of the right side were far less perfect than the left—the discharge still continued copious, and the naked brain was at this time distinctly visible. He is entirely unconscious of the operation, nor was he informed of it by the family. He always supposed the dressings to his head were applied in consequence of a wound received at the time of the injury.

From this period he rapidly improved, and at present is in every respect well. He has frequently visited Eaton on business—and as he has changed his habits of living, his transactions have been more correctly performed than ever.

From the number of cases on record not very dissimilar to this, and others where more laceration and loss of cerebral substance has been produced, we are justified in believing that the most dreadful injuries of the head are not necessarily fatal.

Art. IX. *Case of Poisoning by Opium, successfully treated by Cold Affusions.* Communicated by Dr. James Conquest Cress, of Lexington, Kentucky.

THE following case, that occurred in the practice of Dr. John C. Richardson, in June, 1821, gives additional evidence in favour of the practice so successfully pursued by Mr. Wray, Drs. Jones and Jackson. Had Dr. Richardson published an account of this case shortly after it was treated, he would have secured the credit of having introduced the practice of applying cold affusion in cases of poisoning from opium. The earliest account of Mr. Wray's success is dated in 1822, and Dr. Richardson employed the affusion for this purpose in the summer of 1821.

The patient, under the influence of the gloomiest feelings,

retired early to bed, where she swallowed laudanum—though in what quantity, or how soon after reaching her room, is unknown. About eleven o'clock she was found foaming at the mouth—her breathing deep and embarrassed—and a vial, standing on a chair near the bed, containing a small quantity of laudanum, led to a belief that she had poisoned herself.

Dr. Richardson, who was immediately sent for, being at the moment very much occupied with other professional engagements, requested me to visit this patient, in company with a gentleman who belonged to his office. When we arrived, she was insensible to all stimuli—the pupil did not contract when subjected to strong light—the olfactories were insensible to the most pungent sternutatories—and the skin seemed entirely devoid of sensibility. She foamed copiously at the mouth—her jaws were almost immoveably locked—the flexors of the forearm were in a state of continual subsultus—the skin was cooler than in the healthy state, and covered with a cold clammy sweat.

After some efforts, we succeeded in opening her jaws, and administered large doses of ipecacuanha, tartar emetic, and sulphate of zinc, which only produced a disturbance of the stomach amounting to slight retching. In vain we endeavoured to awaken the system by universal agitation of the body—vinegar was given, notwithstanding Orfila's unfavourable account of it, and although no positive advantage resulted, we were sure that no evil was produced, as Orfila had taught us to expect.

Many other fruitless efforts having been made, we attempted to employ a substitute for Renault's stomach tube, so successfully restored to practice by Dr. Physick, as we could not obtain the proper instrument. For this purpose the end of the largest size male catheter was adapted to a syringe, and passed into the stomach—but the size of the instrument was too small, and it was immediately choked by the mucus of the stomach, and became ineffectual.

Dr. Richardson was again sent for. On his arrival, learning how unprofitable our efforts had been, he resorted

at once to the application of cold affusions. The patient was supported upright in a chair, and large buckets of cold water were poured over her head, and flowed profusely over the rest of her body. This prompt and decisive practice was not so immediately followed by signs of returning sensibility, as in the case recorded by Dr. Jackson. The treatment was persevered in, and the affusions increased in quantity during forty minutes. A return of sensibility now became manifest, and at the end of the next hour she was so far recovered as to be able to articulate distinctly, and complained of a great degree of sleepiness. She was kept awake by forced exercise—an enema made of a solution of common salt was administered—the bowels acted—a blister was applied over the sternum, and another on the ankles. In the morning she was quite recovered, and able to resume her ordinary avocations.

Art. X. *Cases of Impetigo, Humid or Running Tetter, cured by the use of the Sanguinaria Canadensis.* By William Scott Hendrie, M. D. of New Jersey.

Before the time of Willan, much confusion prevailed in the classification of most of the cutaneous diseases, and particularly of the one under consideration, it, with a number of affections having some resemblance, but differing essentially from each other, was treated promiscuously under the title of herpes. But a more judicious distinction has been proposed by this writer, and since been ably perfected by Bateman.

Inpetigo is placed in their fifth order and second variety (psydracium)—is defined "a small pustule, often irregularly circumscribed, producing but a slight elevation of the cuticle, and terminating in a laminated scab. Many of the psydracia usually appear together, and become confluent—

and after a discharge of pus, they pour out a thin watery humour, which frequently forms an irregular incrustation." It is unaccompanied by fever—is not contagious, nor communicated by inoculation.

Five species of the complaint are noticed, viz: impetigo figurata—impetigo sparsa—impetigo erysipelatodes—impetigo scabida—and impetigo rodens. I shall only notice the two first, having never had an opportunity of seeing either of the others.

Impetigo figurata: this is said to be the most frequent variety of the moist tetter. It appears in circumscribed patches of various forms and sizes, which consist at first of clusters of yellow pustules, set close together, and surrounded by a slight inflammatory border—the whole being slightly elevated. In a few days the pustules break, and pour out their fluid—the surface is red and excoriated, accompanied with a troublesome itching, heat, and smarting. In a short time the discharge partially concretes into thin yellowish or greenish scabs—it however still continues to ooze from under them. But in a few weeks more it diminishes entirely, and the scabs become dry and fall off, leaving the cuticle red, rough, and somewhat brittle, so that the ichorous discharge and scabs are easily reproduced. In this way the disease is often protracted for some considerable time—sometimes fresh crops of pustules reappear, as at first, and go through the same course.

The progress of the healing of these patches is various—so much so indeed, as to make it somewhat difficult to give any definite account of the process—though for the most part, we may observe it to disappear in the centre, leaving the border somewhat elevated—this finally recedes, the centre for weeks remaining red, shining, and tender.

Impetigo sparsa: the principle difference between this and the foregoing species is in the form, more than any other particular. Its nature and progress is pretty much the same. The pustules are promiscuously distributed without much regularity over the extremities, about the neck and shoulders, and sometimes on the ears and scalp. It occurs

more frequently than the impetigo figurata on the lower extremities, and here it is more troublesome and difficult to remove.

Some of the vesicular diseases are said sometimes to intermix with impetigo, which is manifest from a common variety of it occurring in the upper extremities, which is much more troublesome on account of the extreme itching, smarting, and heat. It is also more difficult to cure, and is chiefly confined to the *hands*, *fingers*, and *wrists*. The discharge is of so acrid a nature, as to inflame the parts over which it passess. The affected parts look red and chopped—the cuticle is thickened—here and there little humid ulcers may be observed. At its commencement the burning and extreme itching is very distressing, and for the most part, aggravated by almost every application that may be resorted to at this time.

It is not easy to trace the foregoing forms of impetigo to any obvious exciting cause. A predisposition to the disease is supposed to be connected with a sanguine temperament, a soft skin, a relaxed habit—or with a sanguineo-melancholic temperament, a spare form, and thin but harsh skin. It is stated by Bateman, that certain seasons appear to have great influence on the disease, in those that are predisposed to it. The impetigo sparsa, especially on the lower extremities, is said to return with regularity at the latter end of autumn, and to harass the patient during the whole of the winter, but disappears in the warm weather—while the impetigo figurata, affecting the upper extremities, is liable to recur in the spring. I have observed the disease pretty uniformly to be aggravated at the commencement of the cold weather of autumn, and to continue until the warmth of summer, when the patients generally experience some mitigation of the complaint.

It is not at all improbable that the stomach may have some share in the cause of these affections, as it has in many of the cutaneous diseases, and in this way we may account for the accession of the eruption after violent exercise, intemperance, cold, and sudden depressing passions, particularly

fear and grief. The disease is also supposed to be produced sometimes by local causes—persons working in sugar, and bricklayers, are frequently liable to a species of the complaint. In these cases it is, however, entirely a local affection, and readily removed. A want of cleanliness, a low diet, and a damp situation, have been considered among the exciting causes in this complaint—though with little foundation, as it can generally be traced to a constitutional predisposition.

The only diseases with which impetigo figurata and sparsa may be confounded, are two affections—the porrigo and scabies. They differ from the first in not being contagious—seldom affect children, and occur mostly on the extremities. The discharge is ichorous, and does not form the thick, soft, and copious scabs of porrigo. From the heat and smarting which accompany the itching, we may distinguish them for the most part from scabies.

Of those cases which have come under my notice, the larger proportion were females, and from this circumstance it would lead to the conclusion that they are more subject to the complaint. I am not conscious that the remark has been heretofore made.

The remedies usually recommended in this disease are various, and not a little diversified. Ointments of the oxide of zinc, the hydrargyrum præcip. album, with the hydrarg. oxymurias and lard, together with lotions of a similar nature, are for the most part resorted to—and no little merit has been attached to a decoction of digitalis. That this article does frequently afford some relief to the excessive heat and itching, I will not pretend to deny. But every practitioner must acknowledge, how little permanent benefit is derived from the general course of treatment usually pursued. And although we may sometimes have it in our power to oppose a temporary barrier to the rapidity of the current, yet it soon surmounts the obstacles which arrest its course, and not unfrequently returns with increased violence.

About two years since my attention was accidentally at-

tracted to the use of the *sanguinaria canadensis* in this disease, from having seen a most inveterate case perfectly relieved in a short time by its use. Knowing the article to be a popular remedy in the neighbourhood, I was desirous of ascertaining whether it really possessed any remedial influence over the complaint—and having an opportunity of making a number of experiments with it, the results fully satisfied me it was deserving of the praise that had been lavishly bestowed upon it.

As I cannot give a better view of the results of these experiments, than by detailing two of the most prominent cases in which the article was employed, I shall therefore take the liberty of introducing them.

A lady somewhat advanced in life, had for the last fifteen years been affected with impetigo, (which was evidently that variety in which the psydracious pustules were intermixed with transparent vesicles.) The disease was confined to the wrists, hands and fingers. She had frequently been the subject of medical treatment, yet the only advantage derived was occasionally a short respite from some of the most troublesome symptoms—but the slightest exposure to any of the exciting causes, was sure to bring on a return of the complaint. I directed her to procure some of the recent roots of the sanguinaria—to bathe the parts affected two or three times a day with the expressed juice, and at the same time to take small doses of sulph. sodæ. In a few days a very sensible amendment in the parts was evident, and after continuing the prescription for three weeks, not a vestige of the disease remained. About six months after this time, from undue exposure of the parts, a slight return of the complaint was evident. It was, however, immediately checked by a recurrence to the article for a few days—since which time she has remained completely exempt from it.

The next case in which I had an opportunity of testing its efficacy, was that of a lady, who had been affected for the last four years with impetigo sparsa. Here it was confined exclusively to the scalp, neck, and ears. In this case, most of the usual remedies for the complaint had also been

employed, without producing the least benefit. The ichorous discharge was very copious, and the sense of heat and itching intolerable. After directing some cathartic medicines, the sanguinaria was employed, as in the preceding case. The first few applications of the article were attended with so much distress to the patient, that I was fearful of being compelled to abandon it—but by persevering for a few days, the irritation gradually subsided, and in the course of two weeks the disease was completely cured. Eighteen months have since elapsed, without any return of the complaint—and I have every reason to believe the cure will be permanent.

I might proceed to detail a number of similar cases, in which the sanguinaria has been beneficially employed in this disease—but the brevity which should necessarily characterize an essay of this kind, admonishes me of the impropriety of making any further extension. Moreover, I feel confident, that if any person will give the article a fair trial, the above statements will be fully corroborated. I should not, however, conceal the fact, that in a few cases it has not equalled my expectations. It must not, therefore, be presumed, that I consider this medicine as a specific, only wishing to bring it into notice as one likely to afford more relief in this complaint, than any other which I have become acquainted with.

Aware of the difficulty of procuring the root in its recent state, and desirous of ascertaining whether a decoction made of the dried would not be equally serviceable—I used it in this way, in several cases, with some advantage, though it did not appear to act with the same promptness. A common mode of preparing the remedy in the country, is, by macerating the recent or dried root in vinegar. This, in all probability, from what I have seen, is the best mode of preparing it, when the article cannot be procured in its recent state. I have lately prepared it in the form of an ointment, and if the active principle can in this way be extracted, it would be the most eligible mode of employ-

ing it, since moist dressings do not generally agree with the complaint.

I may appear precipitate in thus venturing to add to our already bloated catalogue of remedies. The only apology I can offer is, that it has been done purely from a motive of contributing, in some measure, to the relief of a troublesome and distressing complaint, to which not a few of our fellow-beings are subject. However humble this acquisition may be, if it should in the least succeed, my compensation will be ample—but if, on the contrary, it be found, on further investigation, not to be deserving the praise bestowed on it, I shall still have the consolation of considering myself as not belonging to that class of mankind, who, Fontana says, never err—" those who never reason for themselves, nor make an experiment."

Art. XI. ***Case of Cancerous Duodenum and Scirrhus of the Pancreas.*** **Read before the Pittsburgh Medical Society, by Dr. W. F. Irwin.**

In December 1821, I visited a patient who had been suddenly attacked with vomiting, and violent pains in his bowels, immediately after having drank a pint of strong beer. The pain, I found, was not confined to any particular part of his abdomen, but appeared to arise from cramps or spasms of the bowels generally. The fluid ejected was complained of by the patient as being very sour and intensely bitter. The quantity thrown up was prodigious. Attention to the spasms being of primary importance, large doses of laudanum and sulphuric æther, together with the application of flannels wrung out of hot whiskey over the abdomen, were employed, and in a few hours put an end to the paroxysm. On my visit the ensuing morning I found him quite free from pain, but drowsy and stupid from

the effects of the laudanum, &c. His bowels having been constipated for several days previously and subsequently to the attack—a large dose of senna, manna and salts was administered, which in due time produced a thorough evacuation of the alimentary canal. The life of this patient had for a long time been debauched and irregular.

In April 1823, he was again seized with paroxysms of pain and vomiting, similar to the first attack, and this was also soon removed by the use of antispasmodics and mercurial purgatives. He was left in so debilitated a condition by this spell, as to unfit him for work, and in the early part of May the weakness so much increased as to confine him continually to bed. During the month of April he suffered much—having, with but one or two exceptions, an attack of pain and vomiting, at least once in the twenty-four hours—and from the habit of suffering and disinclination to medicine, most of the paroxysms were permitted to pass off spontaneously, without the intervention of remedies. Whenever the paroxysms became unusually severe, I was called to prescribe, and at such times I always found him labouring under excruciating pain, which was mostly referred to the cardiac, sometimes to the pyloric, orifice of the stomach, accompanied with violent pain in the head, vomiting, and obstinate constipation of the bowels. Irritability of the stomach became so much aggravated that every medicine, except calomel and calcined magnesia, was, immediately after reception, thrown up. The calomel, when in the form of pills, and the magnesia, provided the doses were very large and frequently repeated, would generally succeed in procuring copious alvine discharges—and these were always followed by a complete cessation of the painful symptoms. Several times after the use of the calomel pills, his gums became affected, and I as often observed, as a consequence of the mercurial irritation, such a general improvement in his health, that I urged him to keep his system under the influence of mercury for four or five weeks—hoping that in that space of time some radical change for the better would be effected. To this proposition he refused to assent, and

I left him to his own plan of blistering, fomentations, hot toddy, and calcined magnesia. From May until July I was not called upon to see him, and I learned that during the nterval he had given himself up to debauchery.

The following symptoms continued daily to affect him from July until September 3d, the day of his decease. Great pain at the upper orifice of the stomach, accompanied with frequent and severe vomiting of a green coloured fluid—obstinate constipation of his bowels—tongue always furred—colour mostly white, occasionally brown—countenance and skin generally of a pallid appearance—conjunctivæ of a pearly white—nails of the fingers and toes of a pale blue colour. The emaciation of his body had progressed to an extreme degree. Fæces were never evacuated unless through the agency of purgatives—were of a black colour—fluid consistency, and almost devoid of fœtor. Two days previous to death they contained pus mixed with blood. During a considerable period previous, his sleep was much disturbed—often awaking in a fright. Every kind of food was alike palatable to him, and generally remained an equal length of time on the stomach, viz. from two to four hours. Then succeeded pain and vomiting, which never ceased until the stomach was thoroughly emptied. About three weeks before death a considerable tumour was discovered in the right hypochondriac region, which maintained its prominency for eight or ten days, and then subsided. Before the appearance of the tumour, and while it was present, two physicians of extensive practice were called in, who confidently pronounced the whole of the symptoms of the case to have resulted from *disease of the liver.* This opinion being very different from that I had expressed to the patient and his friends in July, viz. that the disease was scirrhus of the stomach—and that if the liver was diseased, it was a *consequence*, not a *cause*, of the disease of the stomach, I felt extremely anxious to ascertain the true seat of the disease by dissection.

The patient, at the latter end of July, became most urgent in his requests to be salivated—but I informed him

that the proper period for the mercurial plan of treatment had passed by—that neither mercury nor any other medicine would, in my opinion, be of the least service, but would, in all probability, tend to hasten his death. With that opinion he was satisfied, and before I left the house, requested a promise that I would open him immediately after his death should take place—observing, "that although the examination could be of no service to himself, it might, from the precise knowledge gained of his disease, be of essential benefit to others."

Being informed of his death, on the morning of September 3d, I proceeded to the examination, in presence of my friends Drs. Church and Gazzam, and three or four friends of the deceased.

DISSECTION.

Thorax.—On raising the sternum, all the thoracic viscera were found in a healthy condition. The heart rather small—right auricle completely emptied of blood—a small quantity of fat scattered over the apex. On cutting a small blood-vessel on the heart, a fluid oozed out that appeared more like a mixture, of five parts water and one of blood, than blood.

Abdomen.—On exposure of the abdominal cavity, the stomach was seen displaced in a singular manner, and enormously distended. This organ occupied almost the whole of the left hypochondrium—its great curvature extending down to the left iliac region. After its removal from the body, it was opened and its contents were found to amount to half a gallon of green bile, somewhat diluted with whiskey and water, which had been taken for common drink. It was then slit from one extremity to the other, carefully washed, and contrary to the opinion I had formed of its condition, not a vestige of disease was to be discovered in any part of this organ. The liver, also, was free from disease, but adherent on its posterior surface—gall bladder much distended with thin green bile. Having examined thus far without being able to detect the seat of the disease,

our attention was directed to the duodenum, which was found much enlarged, and externally hard and unyielding. On exposing its cavity, it was found in a cancerous state, and closely studded with tubercles, varying in size from a hickory nut to that of a hazel nut. The largest of them contained matter resembling cream somewhat dried. The whole surface of the seat of ulceration, presented a ragged, uneven, lacerated appearance. The quantity of pus found about the diseased part of the gut, was upwards of a gill. *Pancreas* natural in regard to situation, but diminished to one half its usual size, and scirrhous. On cutting into it, the interior presented much similarity in colour and texture to that of boiled cow's udder. Duct natural. The intestines were all removed from the body and spread upon a table for the more particular examination of each division of the canal. *Jejunum* and *ileum* natural—*cæcum* enlarged, and displayed evident marks of inflammation. The coats of the *colon* preternaturally thick, and the calibre reduced to half its natural size. *Rectum* natural. The mesenteric glands enlarged—and between the lamina of the mesocolon were contained several tumours of about the size of a large pea, in a state approaching to scirrhus. All the chylopoetic viscera discovered marks of having been in a highly inflamed state, which, no doubt, was the cause of many preternatural adhesions discovered during the course of the examination. Neither the brain nor the pelvic viscera were examined.

Remarks.—There is one circumstance in the case detailed, as it appears to me, that affords an important diagnostic in the detection of a similar disease. I mean that with regard to food, either solid or fluid, not having excited pain *immediately* after its reception into the stomach. Richerand, on the subject of digestion, informs us, that the mean time which food remains in the stomach before it is formed into chyme, and passes through the pyloric orifice, is from three to four hours. Had I paid sufficient attention to this fact, it is probable that I would have been able to

have pronounced a more correct opinion as to the particular seat of the disease. The accession of pain, and its common accompaniment, vomiting, was, I now believe, always simultaneous with the passage of the chyme through the pylorus into the duodenum. From the diseased condition of this portion of the intestinal canal, as observed after death, and the situation it must have been in for a considerable time previous to that event, one may very readily suppose that the bland and unirritating mass, which, in a healthy condition of the digestive organs would produce rather an agreeable sensation, would be quite sufficient in this case to cause, when it came in contact with the raw and ulcerated surface of the duodenum, all the terrible symptoms of which he complained. Another source of irritation would arise from the influx of bile, that must take place during the presence of the chyme in the duodenum—and if it is a fact, that the flowing of the bile through the "ductus communis choledochus," is caused principally by the irritation or pressure made by the aliment upon the extremity of the excretory duct, it would satisfactorily account for the intervals of ease that were experienced during the period of gastric digestion.

Dr. Pemberton, in his very valuable work on "diseases of the viscera," describes several painful affections of the stomach, and points out with great minuteness the pathognomonic symptoms of each. He first takes notice of an affection commonly termed "pain in the stomach," "which," he says, "when not resulting from organic disease, does not affect the pulse." This "pain in the stomach," he remarks, "arises from conditions of the organ diametrically opposite, viz. in some from fulness and in others from emptiness of the stomach." The latter variety, he thinks, arises from an altered and increased secretion of the glands of the mucous membrane, and that the fluid by its acrimony irritates the nerves of the stomach, and thus causes pain. The pain which is felt from fulness of the stomach, he believes to result from irritability of the muscular coat, and not at

all connected with the glandular secretions of it—for unless the pain be called forth by food being received, it will rest perfectly at ease. "The food will remain down, perhaps, *half an hour or more, before any uneasy sensations are excited.*" "These will go on increasing till the food is returned again very little changed from the operation of digestion." The peculiarity observed by Dr. Pemberton, in regard to the rejection of food *in half an hour or more*, after its reception into the stomach, in the form of disease described by him, may appear to some gentlemen of the profession, to militate against the diagnostic which I have thought pathognomonic of disease of the *duodenum*. The differences between the second form of "stomach disease," described by Dr. Pemberton, and the case I have detailed, are striking. First, the time that elapsed in this case from the reception of food, until its rejection, ranged from two to four hours. The second and well marked difference is, that the food ejected from the stomach of my patient appeared to have been completely digested, or converted into chyme, a proof, at all events, of the absence of functional disorder of that organ. Dr. Pemberton goes on to remark, that "the pain from repletion may be distinguished from that pain which is produced in a stricture of the cardia, by the pain not being perceived *the instant* the food is swallowed—by the seat of the pain not being confined to one spot, both of which circumstances attend a stricture of the cardia—and by there having existed constitutional derangement *previous* to the stomach affection—whereas in stricture of the cardia, the constitution is *subsequently* affected. It may be distinguished from scirrhus, or cancer of the stomach, by the pain not being produced, except after taking food—whereas in either of the former cases, there is more or less of constant pain—and in cancer, what is brought up from the stomach is usually very offensive, and is also more or less of a dark hue—in cancer too we may observe, that there is seldom sympathetic headach."*

* See page 129 of Dr. Pemberton's Work.

From the work of M. Andral, M. D. entitled "Researches on the Pathological Anatomy of the Digestive Canal," from which copious extracts may be seen in the "Foreign Medical Journal," it appears that ulcerations of the duodenum are extremely rare. Out of fifty three cases of ulceration of different portions of the intestinal canal, that were examined by him, but one was found of the duodenum.

REVIEWS.

ART. XII. "*De Medulla Spinali Nervisque ex ea prodeuntibus annotationes Anatomico-Physiologicæ, auctore* CAROLO FRANCISCO BELLINGERI, *Regia Scientiarum Academiæ et Collegii Medici Taurinensis Membro, &c. &c.* Augustæ Taurinorum, ex typographia Regia, 1823." 4to. pp. 133.

THE gratitude of anatomists and physiologists is unquestionably due to Dr. Gall and his disciples for almost all that is at the present day satisfactorily established, relative to the structure and functions of the nervous system. To the attention awakened by him are we indebted for the application of the highest talents, and the most persevering industry, to the elucidation of this interesting yet difficult study. The impetus he originally gave has been felt throughout the civilized world—and the nervous system, formerly passed by with slight observation, in consequence of its supposed mysteriousness, has, since the publication of his researches, been eagerly studied—the structure made known with correctness—experimental inquiries instituted to discover its functions, and the influence of its connexions in health and disease, have led to clearer ideas of general physiology, and more rational views of the practice of medicine. His peculiar doctrines concerning the mind, have, in a similar manner, been followed by the most interesting results—they have led to a more careful investigation of all the facts heretofore known, and to a more refined observation of every circumstance connected with the history of the intellect. His discoveries and theories will form a memorable era in the history of our race—for if parts, or the whole, of his doctrines be hereafter abandoned, the precious fruits of the tree he has planted will continue to be universally enjoyed—will be multiplied and diffused as long as the

human understanding continues an object of cultivation, and man retains that thirst after knowledge, at once an evidence and foretaste of the immortality to which he aspires.

The work of Dr. Bellingeri, on the spinal marrow and the nerves arising from it, now before us, is one prompted by the spirit of inquiry aroused in the manner we have stated. To us it is of peculiar interest for several reasons. And first, because it is written in the Latin language, and is thus made universally accessible—secondly, it is plainly and perspicuously written—and lastly, it is intended to describe what the author *saw*—not what others have *said*—nor what *he could* say, if he were to indulge in quotation, criticism, reference and verbiage, for the purpose of swelling out the volume until its *weight* would be literal, rather than figurative.

In regard to the Latin language as a vehicle for the general diffusion of knowledge, we may be allowed to say a few words. The propriety of employing it, whenever we wish to extend our communications beyond the limits of our own country, is unquestionable, and for this reason—the ideas attached to the words of this language are fixed, and will so remain, undisturbed by the fluctuations daily taking place in the vernacular of every country. If rightly studied and correctly employed, there are no ideas that we can have that may not be intelligibly expressed in it—for granting that many scientific terms and combinations now known, are not to be found in the *classic* dictionary, still it is as easy to invent from the Greek the barbarisms by which they are to be designated, as to employ the same tongue for the purpose of introducing them to our own language. The proportion of such words in any scientific work, would, under all circumstances, be too small to constitute much difficulty—and certainly, for all the perceptible qualities of things—all the faculties of the mind—all the passions and affections of our nature, the Latin language has expressions full enough for the most exuberant fancy—deep enough for the profoundest wisdom—and strong enough for the most gigantic strength of understanding.

We indulge the hope that teachers of medicine will no longer neglect to incite their pupils to obtain a proper knowledge of this language, that they may not only derive the advantage of *learning*, through it, what has been done abroad, but that they may be able to diffuse a knowledge of their own discoveries, and their own improvements, without circumscription or impediment. Were this method universally adopted, we need no longer be indebted to blundering translators for garbled extracts, or forced to learn all the dialects of Babel in order that we may read for ourselves—but the treasures of science, from one extremity of the earth to the other, would be wafted in rich profusion by the untiring wings of the Roman eagle. What is written in a modern dialect may serve for our own people during a few generations—but if we write for future ages, and all countries, and would erect a structure to outlast all other materials, we should assiduously employ ourselves in exploring the quarries of "eternal Rome."

The Anatomical Observations of Dr. Bellingeri are contained in six chapters—his Phylological Animadversions are given in four—each chapter is subdivided for the purpose of considering different relative articles.

The first chapter treats of the disposition of the cineritious substance in the centre of the spinal marrow, concerning which, anatomists have hitherto greatly differed. Lieutaud said it had the shape of two crescents—Winslow of a horse shoe—Huber of the os hyoides—Monro of a cross—and Haller of four lines, or a double cross. Gall accurately delineated the form of the cineritious substance as having this figure)-(. The description given by Rachetti, agrees well with that advanced by Lieutaud.

In preparing the spinal marrow for examination, Dr. Bellingeri remarks, that experience proves the fuming nitric acid to be the best agent for its coagulation, but it is to be observed, that if not well diluted, the colour of the nervous matter is destroyed—the whole becoming of a deep yellow. When the acid is diluted until it gives merely a distinct sensation of acidity to the tongue, it effects the de-

sired hardening to the greatest advantage, and the preparation may be kept for an indefinite period. Without such coagulation it is scarcely possible to perceive the structure of the medulla, unless it is slightly affected by cold, on account of the softness and semifluidity of its substance.

When the medulla is thus coagulated and cut transversely, the form of the cinereous and fibrous, or medullary texture, is made evident—the cinereous in the human medulla, and in that of the ox, having the figure)–(, but this is varied somewhat in different parts of the spinal marrow, according to its quantity, position, and figure. These variations he considers as being of considerable importance, both in the anatomy and physiology, and describes the appearances presented by sections of the medulla, made in different parts of its length. Our limits do not allow us to give all the details of his observations, for which we refer the reader to the original. The general conclusions, however, may be presented in a condensed form.

"From the disposition of the cinereous substance, and the presence of the sulci, it is evident that the spinal marrow is divided into six whitish or medullary bundles, the two anterior of which, are in great part divided by the middle anterior sulcus, but communicating at the bottom of this sulcus with each other by whitish matter—but the anterior bundles are in great part divided from the lateral, by the anterior horns of the cinereous substance. Yet in this region* the anterior and lateral fascicles intercommunicate—for their anterior horns do not entirely reach the periphery of the medulla—there are finally two posterior fasciculi, both almost divided by a middle posterior sulcus, and also wholly divided from the lateral fascicles by the posterior horns of the cineritious substance, and by collateral posterior sulci. A comparison made of the various bundles, shews at the superior part of the spinal marrow, as in almost all the other portions, that the lateral are the thickest, next the posterior, and last the anterior fasciculi."

Bellingeri proposes for these fasciculi the names of *cerebral* for the *anteriour*, because they communicate with the pyramidal bodies, and directly with the cerebrum†—*resti-*

* Immediately above the first cervical nerves.

† In a note, Bellingeri states, that Tiedemann published an account of

form for the *lateral*, because continuous with the restiform bodies—and *cerebellous* for the *posterior*, which are continuous upwards with the cerebellum.

In every case he found, first, that the quantity of the whitish or medullary matter, by far exceeded that of the cineritious substance, from the commencement of the spine down to the sacral region—but there the quantity of both substances was equal, or the cinereous predominated—second, this substance was most abundant in the cervical, the middle of the lumbar, and the whole of the sacral—third, the form of the cineritious substance is like this)(at the beginning of the spinal marrow, and of this figure throughout the whole tract)–(, except at its extremity, where the figure was quadrilateral—fourth, the cineritious substance, or the tract uniting their semicircles, was more or less placed at their anterior part, from the beginning of the spine to the middle of the lumbar region, but there and in the sacral region, it either occupies the centre of the medulla, or verges a little more posteriorly—fifth, the anterior horns of the cinereous substance are every where thicker than the posterior, and at no point extend to the periphery of the spinal marrow—sixth, it is uniform that the middle anterior sulcus in no place comes into contact with the cinereous substance, and on the other hand, the middle posterior sulcus, throughout, descends to this substance.

He next examines the disposition of the cineritious substance in the spinal marrow of the ox, the kid, and in birds, and finds throughout, a general similarity of structure, though there are in each, slight peculiarities of difference, which we cannot here transcribe for want of room.

In relation to the origin of the nerves from the spinal marrow, he observes, that the anterior filaments of these

this demonstration of the direct communication by means of nervous fibres between the pyramidal bodies and the cerebrum, in the *Annali Universali di Medicina*, Tomo XXI. p. 421. The same demonstration was made in this city, (nearly a year before the reception of Tiedemann's article,) by Dr. Godman, and appended in a note to the last edition of Richerand's Physiology.

nerves arise partly from the anterior fasciculi of the spinal marrow, and some nervous filaments come off directly from its surface, and from its whitish substance, pass through the pia mater, and receive a covering therefrom—but other filaments descend deeply into the whitish matter of the spinal marrow through the little canal formed by the pia mater, and perhaps sometimes reach to the cineritious substance. These filaments are broken by the removal of the pia mater, but the first mentioned sometimes remain even after the pia mater has been removed. These filaments, therefore, arise directly from the whitish or medullary substance, not from the cinereous. Other filaments of the anterior roots, which are in the middle of these roots, in the region of the collateral anterior fissures, penetrate the medullary substance deeply, by the little canal formed from the pia mater, and perhaps even come into contact with the anterior horns of the cinereous substance, as they are placed directly before them. There are finally, other filaments of the anterior roots, which are placed more on the external side of the medulla, and may be seen to arise from the lateral medullary fibres, by removing the pia mater, yet so that some of them may be seen intimately entering the medullary substance, others coming directly from the surface of the white matter, and then passing through and receiving a covering from the pia mater.

As to the origin of the posterior roots, they come out directly from the posterior collateral sulci, wherever these sulci are present, and through a little canal formed by the pia mater they arrive even in contact with the posterior horns of the cinereous substance—but if these horns are produced to the periphery of the medulla, then the original filaments of the posterior roots go out directly from the posterior horns, pass through the pia mater, and receive a covering from this membrane. Other filaments of the same roots are observed, which arise from the posteriour fasciculi, and others from the lateral fasciculi of the medulla, but very near to the collateral posterior fissures. The origin of all these filaments is varied in two ways, as above

observed, in relation to the anterior roots—some of them enter the canal formed by the pia mater, and thus profoundly penetrate the medullary substance—and when the pia mater is removed, these little canals are torn off, and leave the above described little points on the surface of the medulla—while other nervous filaments, arising from the posterior fasciculi, as well as from the lateral, go out directly from the whitish substance of the medulla, pass through the pia mater, and receive a covering therefrom.

" Gall has therefore asserted, without foundation, and attempted to demonstrate the origin of all the nervous filaments, even in the spinal marrow, from the cineritious substance.

" All the filaments of the spinal accessory nerve arise from the lateral fasciculi of the spinal marrow, and penetrate the medullary substance deeply, nor is there any communication between the accessory nerve and the posterior spinal nerves in the spinal marrow of the ox—but in man, the accessory nerve has the same origin: but sometimes it receives all or many of the filaments of the posterior roots of the first pair, and sometimes, though rarely, even a filament of the posterior root of the second cervical—yet the accessory nerve does not retain these filaments, but parts with them again, to form or increase the posterior roots of the first cervical pair."

Dr. Bellingeri thinks the lateral fasciculi of the spinal marrow may be considered as pertaining to the organic functions, because the spinal accessory nerves arise exclusively from them, and because above they are prolonged into the corpora restiformia, which are concerned in giving origin to the pneumo-gastric and glosso-pharyngeal nerves. His remarks on the subject do not depend on any thing stronger than the reasons stated.

That the anterior roots of the spinal nerves belong to the organs of motion, he deduces from the origin of the third pair of nerves from the crura cerebri—the sixth pair from the pyramidal bodies, exclusively a nerve of motion, and from the origin of the greater number of the filaments of the hypo-glossal nerve from the external sides of the pyramidalia. " Moreover, hemiplegia of the side opposite to the part of the brain injured, shows that the cerebrum properly so called, is employed in governing the voluntary

motions—for if hemiplegia were produced by lesions of the cerebellum, it could not happen on the opposite side, as there are *no decussations* in the productions of the cerebellum." It will at once be perceived how much this is opposed to the ordinary ideas on the subject, for it is by the origin of the fibres of the corpora pyramidalia from opposite sides, that Dr. Gall accounts for the paralysis of the opposite side in hemiplegia. Yet notwithstanding the crossing of the fibres of the pyramidal bodies, and the free communication between the crura cerebri and cerebelli over the surface of the corpora pyramidalia, described by Tiedemann in Europe, and Godman in this country, the relations given by Morgagni, Serres, and others, of their dissections, shew, that in hemiplegia, the fluid extravasated is almost always found in the ventricles, or over the surface of the cerebrum, and the pressure on the cerebellum and medulla oblongata cannot be produced except in an indirect manner.

The functions of the posterior roots of the spinal nerves, Bellingeri believes to belong to the animal sensibility, in consequence of their origin from the cineritious substance, their plexuous and gangliform character. The posterior roots alone, he thinks, are employed to form the organ of touch, and indeed not all of these fibres, but only those filaments which directly arise from the posterior horns, or communicate with them.

His next chapter treats of the antagonism of the nerves—the object being to ascertain whether there are not nerves peculiarly appropriated to the muscles of extension and the muscles of flexion, and not indiscriminately supplying either set. "Can it be believed that the nerves arising from the cerebrum, cerebellum, and its processes, indiscriminately serve for these emotions? Should we not rather believe that the cerebral nerves serve for one kind of emotion, and the cerebellous for another? This last is my opinion—that the nerves coming from the cerebrum and its processes, are employed in the motions of flexion and abduction—and that the nerves arising from the cerebellum and its produc-

tions, govern the movements of extension and abduction." In this belief, Bellingeri thinks himself supported by comparative anatomy, physiology and pathology. Among the instances of this antagonism, he offers the fourth pair and the sixth of the head, the first being an adductor and the last an abductor—the fourth arising from a process of the cerebellum, and the sixth from a process of the cerebrum, &c. The phenomena of paralysis and tetanus are the circumstances by which he attempts to derive aid to his doctrine from pathology. His reasonings from the facts quoted from Aretæus and Morgagni, have at least the merit of candour and ingenuity.

The internal or communicating branch of the spinal accessory nerve, he believes, with Willis, to belong to the organic and involuntary structure. The functions of the external branch he thinks to be clearly established by the experiments of Charles Bell, to consist in connecting the parts it supplies with the proper organs of respiration—and finally, that the whole of the spinal accessory nerve is dedicated to motion, and not to sensation, as it nowhere reaches to the skin. His last chapter is devoted to a consideration of the use of the cineritious and medullary structure. The cineritious, he thinks, is for sensation—the medullary (or fibrous,) is for motion, which is supported by the observations previously made relative to the origin of the sentient nerves from the cineritious substance, and of the motive nerves from the fibrous—as well as by the origin of the spinal accessory nerve being wholly from the medullary texture. "I would particularly remark, that in infants who are extremely sensible, and whose muscular motions are weak and feeble, the cineritious substance far exceeds the medullary—but in adults whose muscular power far exceeds their sensibility, the proportion of the white, or medullary, substance, far exceeds the quantity of the cineritious."

Although Dr. Bellingeri has not added a great deal to our previous knowledge on this interesting and difficult study, we think his work may be perused with advantage by any one wishing to become intimately acquainted with

the details of the subject. He is so unaffected and earnest an inquirer after truth, and so plain and perspicuous in his descriptions, so free from pedantry and obscurity in his expressions, and so charmingly modest withal, that no one can read his book without feeling high respect for him as a philosopher and as a man. The following extract concludes his essay.

"All that I have advanced in a study so obscure, is submitted to the criticism of the learned, nor do I offer what I have written, as altogether fixed and fairly demonstrated, though I think it may possibly add some light. It will be equally grateful to my feelings, to have what is here advanced, confirmed, or else evidently refuted, by the efforts of others."* Θ

Art. XIII. *Essays on various Subjects of Medical Science.* By David Hosack, M. D. F. R. S. L. & E. Professor of the Theory and Practice of Physic and Clinical Medicine in the University of the State of New York. 2 vols. 8vo. New York. J. Seymour. 1824. pp. 380 and 472.

WE are not among the number of those who conceive it necessary to suffer envious and unfriendly feelings to prevail towards our neighbours, or to be mortified at their success. To feel regret because our brethren of an adjacent city have succeeded in erecting an useful medical school, is every way unworthy of a liberal mind. While the numerous trying collisions, incident to the medical life, produce rivalries and enmities among too many of the profession, it is the duty of those, who undertake to disseminate science, to take a higher stand—to reject the private personal interests of the man, and treat and

* Cuncta a me enunciata in re tam tenebrosa sapientium judicio submitto; non enim ut firma omnimodo, et penitus demonstrata, quæ scripsi habeo, sed aliquam fortasse lucem afferre posse opinor; mihi æquegratum erit si a me prolata, alienis laboribus confirmata, vel evidenter refutata erunt. P. 118.

honour the individual in the sole and exclusive ratio of his usefulness to humanity. Placed as we are in a city, between which and New York there have been too many real and imaginary rivalries, we can truly declare, that so far from feeling scandalized at their success, the credit and reputation of the physicians of that city are a source of real pleasure to us. Americans have too little justice done them abroad, to afford to make light of the literary and scientific merits of any portion of their countrymen. Neither the French nor English are acquainted with us: the one from an apparent disinclination, (which, not to be unjust in our turn, appears now to be rapidly diminishing)—the other from the difficulty of a foreign language, have alike remained almost ignorant, till of late, that there were such things in existence as American books and American medical schools. Times are in some measure changed, and there is now more intercourse* with us, than formerly —though it is impossible, from the nature of things, that fame in foreign countries can ever be an adequate reward or inducement for the labours or inquiries of our countrymen. The pursuits of physicians in the European countries run in particular veins. Naturally more familiar with the publications of their own countrymen, which alone they can read with general facility, also possessing a strong national partiality, sufficient to lead to a much

* The late sudden taste for American literature, developed in England, and which has commenced by praising the writings of Washington Irving, may possibly owe a part of its origin, in addition to the real merits of that writer, to political circumstances, which have thrown the two countries more together—much, also, to Mr. Walsh's Appeal. It has shown itself in medicine, by the republication of a great number of essays from the American journals in those of England. The French, at least the Liberals, we believe are well disposed to us—and we have had of late more intercourse with them, from the number of well qualified young men who have gone thither for improvement in their profession—yet it is obviously unreasonable ever to expect that the physicians of that country, differing so far in their peculiar views, as well as in language, will ever make large use of American works in medicine, be their merits what they may.

higher estimate of their merits than of those of the corresponding works of others—and adding to this the knowledge that their medical schools have real, high, and long established characters, Europeans are apt to value but lightly, *prima facie*, any works which bear a foreign impress. Except the Germans, the only people always liberal to foreign science, there is perhaps a pretty general impression, in each nation, that its own literature contains all that it is necessary to know, and that its own citizens carry on all the most important parts of the business of observation and discovery. If this become a principle acted upon, and even avowed,* between England and France, how can we expect either of these nations to pay much attention to the writings of a people so far their juniors as we are? It is to the praise and patronage of an American public, that we should look for the flattering reward at which so many writers aim. However circumstances may attract a transient kindly glance from our transatlantic friends, we cannot, in conscience, expect them to continue steadfastly to care much about us. Let us then cherish American reputation, and increase American usefulness, as far as possible—not until our diseases are well understood and described, and a systematic effectual practice founded, for that is done already, to an extent surprising for the means possessed, but until a *reading public* be formed sufficient to permit those who toil for the improvement of our science to make public their labours, and thus to concentrate and gradually improve the knowledge we already possess, without pecuniary loss.

In America we have to contend with one very serious disadvantage—the want of a great *capital* city. Whatever benefit may be derived from this circumstance in a political respect, to science and literature it is a cause of incalculable retardation. In England, London, and in France, Paris, are the great theatres of book publishing. The whole nation

* See the concluding observations in the paper of Mr. Charles Bell, on the Nerves of the Eye, in the Philosophical Transactions for 1822.

is in the habit of looking to these centres, both for new works and for opinions on them—a publication there lays a book at once before a large community—and if not of a nature to penetrate to a distance, the capital alone affords a very sufficient patronage. Hence a work of any pretensions may always calculate upon support for at least one moderate edition—and it then possesses a fair opportunity for making its merits known.

In the United States, on the other hand, it is difficult to obtain support for any medical book, unless required by the necessities of the classes at the universities—and it is so much the more incumbent on us to concentrate the little circulation we possess. Now it is too notorious that we are divided into sections and neighbourhoods—that we hear and know very little of the labours of physicians in the remote cities. Philadelphia takes little concern in Boston medicine, nor does Boston know or care more about that of Philadelphia. Various medical publications are made, from time to time, and many more would be made, if encouraged, in the cities and towns scattered over the Union, which are deprived of the assistance, the encouragement, and the critical notice which would meet them in a great capital—and which, therefore, are deficient both in the number and quality desirable to form a national medical literature. As, then, destiny will have it so—since neither Washington, Philadelphia, nor New York, can, like Aaron's rod, swallow up her neighbours, and become the American London, what means yet remain to us by which we can remedy this evil, and give a physician who wishes to publish, a fair chance to have the whole country for his supporters? No resource exists, and nothing can be done but to encourage a spirit of mutual attention and esteem, to endeavour to remove the feeling that leads us to undervalue those who reside in other districts. Keep constantly upon the look out for the productions of all the principal cities, from each of which very valuable works have repeatedly issued—and do not let their patronage and usefulness be confined to the comparatively narrow circle connected with a single community.

But our pen has run riot. While giving vent to our feelings on these considerations, so vital to our medical literature, we have relinquished our subject and our author. In the two volumes before us, Professor Hosack has embodied a variety of essays written at different times and on various subjects. Of these, eight are literary, historical, or biographical, comprising notices of the following eminent men, viz. Drs. Rush, Wistar, Tillary, and Hugh Williamson, as well as a sketch with a rapid hand of the progress of the medical schools of Philadelphia and New York, possessing considerable interest. The remainder are all exclusively medical.

The first essay in the collection, that on the power possessed by the eye, of adapting itself to different distances, is an excellent and admirable specimen of the true inductive mode of studying physiology. It was written while the author was yet a student, and published in the transactions of the Royal Society for 1794. We well remember having been struck, at an early period of our medical studies, with the force and justness of the inference maintained in this piece. Scarce had we ascertained what was the subject of inquiry, when a glance at the beautiful figure by which it is exemplified, hurried us irresistibly to his conclusion. The author, however, is by no means disposed to carry his inferences at a glance, but employs all the patience so necessary in a scientific investigation. The object of this piece, which we consider as established to the satisfaction of a rational inquirer, is to prove that the power of adapting the eye to small distances, resides in the four recti muscles —that it is voluntary and active, compressing the eye in a circular manner, thus at the same time increasing the convexity of the cornea, and removing the retina to a greater distance--both which changes, as is well known to opticians, increase the fitness of the eye for viewing near objects. The adaptation to greater distances, on the other hand, consists in a mere relaxation of the same parts, allowing the elasticity and distension of the eye to produce the reverse effect. Hence the fatigue and pain occasioned by

looking at near objects—the greater facility for this effect in youth, and its diminution, with the loss of muscular strength, in old age, &c. None of the *theories* offered for explaining the mode of these changes on other principles, are worthy to be set in comparison with this fair and sound induction.

Next follows an essay on the surgery of the ancients, in which our author amply displays his well known learning. It may arise from partial views, but we cannot help considering these researches into what the ancients thought on a subject which the moderns understand so much better, as mere matters of curiosity—rather a portion of *history* than of the *practice* of the *healing art*. It may be a useful employment of intellect, but does it improve the profession? Is a man the better *practitioner*, for knowing that Celsus treated fistula with linen threads, that Galen was well acquainted with ulcers, or that Paulus Ægineta performed bronchotomy? At the same time that we consider this as rather the luxury of science, we are loth to diminish the estimation of learning of *any kind*, and can only say, that history must be studied, to do justice to the discoverers who have preceded us.

Next follow three papers connected with the subject of yellow fever—and which have been already laid before the eyes of many of our readers. They are "Observations on the Laws of Contagion"—"Additional Observations on the Communication of Contagious Diseases, and the means of arresting their progress"—and "Observations on the means of improving the Medical Police of the City of New York"—amounting in all to two hundred and seven pages. In these our author, who is well known as the leading supporter of the doctrine of contagion in the above disease, may be supposed to have given us a fair exposition of his sentiments. We are very far from wishing or consenting to embark, at present, in the stormy ocean in which the yellow fever question is involved. It has certainly been discussed sufficiently. It has been discussed, until the life of man is

scarce long enough to spare the time for a fair examination of all that has been said. The passions and interests of men are too much engaged in this dispute to permit us reasonably to hope that there will be unanimity upon it in our day. We must wait for the operation of time, for the gradual accumulation and republication of fresh successive evidence, and for the demise of those who are now employed in defending their opinions with violence. When our race has passed away, and our feelings are buried in the grave, something more like unanimity may appear. We do not mean actual unanimity—as the opinions of physicians of rank and influence are transmitted to their pupils, and medical disputes are thus prolonged to successive generations—but the warmth of opposition having subsided, those who see yellow fever will have their due influence, and their observations, themselves, now rapidly coalescing, will be the more attended to by those who do not possess the same opportunity.

The observations of our author have been answered, as every thing which has appeared on that side of the question has been, minutely and at length. The essay on the New York medical police in particular, was replied to in a pamphlet of great length and research, inserted in a former number of this Journal, by our townsman, Dr. Samuel Jackson, then president of the Board of Health. We repeat, that we will not enter into the merits of the question—though as considering it to be the bounden duty of every medical man, we shall not shrink from expressing our opinion distinctly, upon a subject of so great consequence to mankind. We are then, unreservedly, and from observation, non-contagionists—adding ourselves to the immense majority of North American physicians, ascertained to be of that way of thinking.*

* Many of our city readers will recollect the testimony of Dr. Chervin, of Paris, who travelled through the West Indies and the United States, to collect the opinions of physicians on this point. He addressed himself exclusively to those who had *seen* the disease. Of these he was heard repeatedly to declare, *twenty* were non-contagionists to *one* who believed it.

While thus recording our protest, we are bound to testify to the general merits of the papers before us. No one can form a sufficient judgment of the state of the question, if question it be made, without reading these able defences of that side of it. Yet it is proper to add, that the representation given in the essay on medical police, that the non-contagionists are generally juniors, not well informed on the subject, is declamatory and unfair—unless there be some local circumstance to justify it, with which we are unacquainted, and which we can hardly imagine. Among those who originally believed yellow fever contagious, and became convinced by experience of the contrary, are some of the first names in medicine, which this or any other country ever produced.

The "Observations on Fever," are a general review of the subject in thirteen pages—the particular intention of which appears to be, to inculcate the idea of an injurious change in the condition of the *fluids*. This principle has of late been much discussed, and we have not yet done with it. But the present is not a proper occasion to resume its consideration As furthering this view, which has long been among the articles of the New York medical creed, we have an essay, giving a clear and well made-out narration of two cases of small-pox, communicated to the fœtus in utero—followed by an enumeration of a number of similar instances, from various authorities, and some remarks upon the syphilis of new-born infants.

We have next an account of two cases of disease in infancy, accompanied by many of the usual symptoms of a "closure of the foramen ovale," and, in particular, by violent screaming spells. These the author recovered by baths made according to the following formula:

Take of Peruvian bark, four ounces.
Water, two gallons.
Boil a few minutes, and add
Jamaica spirits, one pint.

In the essay on croup, a subject, to the knowledge of which, to the *American* public, there has been for a long time but little added, a practice is directed, very similar to that commonly employed in our country. He expresses himself, however, adverse to the employment of bleeding, to the extent necessary to produce fainting. His objection is, his "having observed serious and permanent evils to the constitution, from the debility which this profuse evacuation had produced." The writer of this review has taken a previous occasion to express his opinions, or rather what he conceives to be his *observations*, on the principles of blood-letting. He would, however, add the remark, that bleeding, in various diseases, to the extent of producing more or less faintness, is, with many physicians both in Europe and America, not an unfrequent practice, and that the English physicians generally, when they do bleed, take a larger average amount of blood at an operation than we do. Among those who seem to have made the trial more frequently than, from our author's statement, we are to presume he has done, we certainly do not often hear of such injurious debility. Their experience seems generally rather to confirm the observation which the writer of this has drawn, both from his own practice, and that of a number of physicians which he has free opportunity to witness—to wit, that there was materially *less* blood drawn by a *judicious* employment of bleeding till relaxation is produced, than by drawing a smaller quantity of blood, at a far greater risk of being obliged to repeat the operation. Croup does not form an exception to the general rule, to make up the mind what change you wish produced by bleeding, and persevere till the designed effect be produced.

If we are not mistaken, our author lately followed the distinction between the *laryngitis* which attacks adults, and the common trachitis of children. In this paper, though adult cases are mentioned, this difference is not recognised. We have known cases of the first-named disease, but cannot help doubting of the propriety ef the distinctive appel-

lation. This piece is illustrated by a very neat engraving of a case of the inflammatory membrane.

The sixth article is an account of the last illness of our unfortunate townsman, the late Mr. James Hamilton. The disease appears to have been glossitis, of extreme violence—being seated in the substance of the tongue. To this case is added another, which occurred in the New-York Hospital, and was drawn up by Dr. M'Vickar, then attached to that institution.

To this succeeds a brief account of the peripneumonia typhoides, occupying six pages, besides a quotation from Sauvages, conveyed in the form of a letter to Dr. J. R. Beck, of Albany: and next, a case of constipation, cured by calomel—and an essay on the usefulness of emetics in that affection, inserted in a late number of this Journal.

A paper follows, on phlegmasia dolens, in which the author enumerates nine cases, one of which occurred in a man. We well remember a neat coloured engraving of a similar case in a boy, inserted in one of the London journals. This he considers as an inflammatory affection, usually proceeding from suppressed natural excretions, cold, stimulating drinks, and other means of excitement—he thinks that it is not necessarily connected with the lochial discharge—that the first irritations appear frequently about the calf of the leg, and not in the glands of the pelvis and groin, as taught by Dr. Denman—that it does not arise from rupture of lymphatics, by the head of the child, as it follows easy as well as difficult labours—and that it is sometimes transferred from one limb to the other, particularly when depletion is not fully employed. In his treatment of the "active stage," he depends upon the "general means of subduing inflammatory action," and afterwards employs general stimuli and tonics, stimulating spirituous liniments, friction, and the roller. He then proceeds to analyze and answer a paper by Dr. David B. Davis, inserted in the 12th volume of the London Medico-Chirurgical Transactions—in which are given the result of four dissections, in which were found the iliac and femoral

veins completely obstructed by coagula of blood, adhering in some parts to the inner surface of the vein--and from which it appears to be inferred, (we have not the volume now at hand,) that this is the origin of the disease—that these veins are injured or irritated in child-birth, inflame, and more or less obstruct themselves by an effusion of fibrous lymph, and the coagulation of the blood within their cavities. That this obstruction is a sufficient cause for many of the phenomena of phlegmasia dolens, is sufficiently obvious—especially since the re-discovery of the venous route of absorption. Dr. Hosack, however, does not consider this pathology as proved, but advances several forcible arguments to show that it is more probable that the inflammation commences in the lower part of the limb, and that the affection of the veins is secondary, and does not always prevail, at least to the extent of a closure. It is a satisfaction to find a coincidence, at least as respects the inflammatory character of this affection.

Several cases of tetanus are inserted, in order to exhibit the great utility, and the sufficiency of wine alone, with local applications for the cure. The pathology of Dr. Saunders, of Edinburgh, is that to which we most incline in this complaint. We are thus guided by his dissections, by one to the same conclusion which we made ourselves, and by the usefulness of issues to the spine, over the origin of the nerves of the part affected. This practice has been followed, with success, by Dr. Hartshorne of this city, and by others. Of the usefulness of wine, especially in the early stage, few will doubt, and the cases narrated are interesting. Dr. Hosack's objection to the discordant and nauseous mixture of remedies sometimes employed, leading to their rejection by vomiting and destroying the effects of each other, is well founded and soundly practical.

Carbuncle, the subject of an ensuing paper, is treated by our author with a nutritious and stimulating diet—free use of bark and wine—spirituous lotions, and cataplasms of bark and yest. He does not make mention of blisters—that in-

valuable resource in the worst cases, which we owe to Dr. Physick. Observations on the advantages of exposing wounds to the air after capital operations, and of removing the whole breast, when a part of it is affected with cancer, are brief and valuable practical papers. The first of these measures has been often resorted to in this city.

The remaining essays consist of brief remarks on gout—on tic douloureux—on angina pectoris, which is referred, as a cause, to plethora—on ergot, which our author accuses of destroying the child, but recommends in uterine hemorrhage with great relaxation of the contractile fibres—and on the mineral waters of Ballston—cases of hydrocele, aneurism of the femoral artery, and of enteritis, with an appendix to the ileum resembling an additional piece of intestine—accounts of the last illnesses of Robert Fulton and George Frederick Cooke—and two papers on the weather and diseases of New York, one from 1810 to 1814, the other for December 1823, and January and February 1824. The death of the lamented Fulton was caused by a violent inflammation of the lungs, afterwards transferred to the external parts of the neck, lower jaw and right parotid gland. That of the unfortunate actor was owing to well known causes. The examination of his body exhibited an instance of the tuberculated liver of Dr. Baillie.

The journals of the weather and diseases are a kind of writing of great utility, and recommended by high authorities, but neither very agreeable in the perusal, nor affording many materials for a condensed analysis. They afford opportunities, from time to time, of making a variety of practical remarks, in which great weight will, undoubtedly, be given to our author's long experience. In these we again encounter the learned professor's belief in the contagion of yellow fever. Many of the opinions expressed in the journal under consideration, are such as are treated of in the essays of which we have already given a running analysis—and much matter is historical. Our space being rather contracted, we shall not go into a more minute examination.

Every medical man, on the whole, will be pleased to see physicians of the experience and opportunities of Dr. Hosack, give the results of their observations to the public —and we among others, shall gladly welcome any future contributions of the kind. He has done well to reassemble his scattered papers in a volume. Were we disposed to censure, we should say they should have been written over again. Having been prepared for various occasions, and several of them being extracts of letters to his friends, it is not to be expected that they should be equally well adapted to publication at the present day, and in their present form. As, however, the reply to this is, that his extensive engagements do not allow him sufficient time, we can say no more than that experience is of more value than methodical arrangement, and that it is far better that we should have the opinions and observations of such a man unpruned and unarranged, than that we should not possess them at all. We would only add, that the limits of this brief review, do not allow us to do justice to the subjects of it, and must refer to the original work for a more full acquaintance with them.* B. H. C.

* We are indebted for the above review to a much esteemed correspondent. While we agree with the tenor of his remarks, there are some, which a regard to consistency in our medical principles, must compel us to disclaim. In his praise of the work, as a whole, we entirely coincide, and do most cordially invite the learned author of it, to continue his useful labours. By his writings he has already signalized himself, and done much to elevate the character of the medical literature of his country. Let him, however, bear in mind, that not a little remains to be done, and what are her claims on his talents, erudition and vast experience.—*Editor.*

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

ANATOMY AND PHYSIOLOGY.

*Influence of the Eighth Pair of Nerves on Digestion.**—M. Vavasseur, in the course of a set of experiments, by MM. Breschet, Mylne Edwards, and himself, on the influence of the nerves on the different functions, has had occasion to repeat the important researches of Messrs. Brodie, W. Philip and Broughton, concerning the effects of the division of the pneumo-gastric nerves on digestion—and the experience of the French physiologists has amply confirmed, and even extended the conclusions drawn by those of London. As the results at which they have arrived are of vast importance in respect to the physiology of the nervous system and of digestion, we shall make no apology for detailing them, although they have all been for some time before the public in the works of the British experimenters. 1. They first found, that when the conjoined pneumo-gastric and sympathetic nerves were simply divided in the neck of a dog seven hours after eating, the food was far less altered by digestion than in another animal fed in the same manner, and killed after the same interval, but not operated upon like the former. "The food, however, was somewhat pulpy towards the pylorus, and digestion had evidently begun, as the lacteals contained chyle." 2. They next observed, that when a portion, two inches and a half long, was removed from the conjoined nerves on each side of the neck in a dog newly fed, the alimentary matter, ten hours afterwards, was hardly altered, had a clean, very dry appearance, and was merely besmeared on its surface with a thin coating of chyme. In another dog, treated precisely in the same manner, except that the nerves were simply divided, digestion had advanced very far. 3. Magendie had imagined that the cause of digestion being impaired or prevented by the section of the pneumo-gastric nerves in the neck, might be the injury done to the respiration by the division of the pulmonary nerves—because he found that the food under-

* Thèse soutenue a la Faculté de Médecine de Paris, par —— Vavasseur, 1823.

went the usual changes, if the section of the nerves was performed lower down than the giving off of the pulmonary plexus. M. Vavasseur and his coadjutors have shown this supposition to be groundless—for the changes produced by digestion were completely prevented, by tying a double ligature at the bottom of the gullet, and dividing it between. 4. Wilson Philip having observed, that the destruction of the lower part of the spinal cord impeded digestion, was led to infer that it is diminished by any cause which weakens the nervous energy. This conclusion has been satisfactorily confirmed by the Parisian experimenters, not only by the repetition of Wilson Philip's experiment, but likewise by the effects of injuries done to the brain, either through external force or by internal agents. When a portion of each hemisphere of the brain was removed in a dog newly fed, the food in eight hours was less altered than after the simple section of the pneumo-gastric nerves. And when an animal newly fed was plunged into a state of stupor by the injection of opium into the veins, the food, though considerably changed in eight hours, was much less altered than in another animal not brought under the influence of opium. "We see, then," they conclude, "that whenever the intensity of the nervous influence is diminished, digestion is sensibly retarded. Whether the intensity be lessened by destroying a part of the brain or spine, or by bringing the system under the action of stupifying drugs, or by preventing the transmission of the nervous fluid along the nerves which conduct it to the stomach, the same results are uniformly obtained." 5. The last object of their attention was the alleged power of the galvanic fluid to effect the same changes as the nervous influence on the food in the stomach. They first experimented on the horse. In one, immediately after it had fed on oats, the nerves were divided on both sides of the neck, and a portion removed two inches and a half long. In another this was done on one side only, while the opposite nerve was simply divided, and the lower end detached from its connexions, surrounded with a plate of lead, and connected with one side of a battery of fifty plates. The other side of the battery was then connected to another plate of lead, which was placed in the cavity of the abdomen upon the stomach—and the experimenters satisfied themselves, that the galvanic stream was kept up continuously by the frequent slight contractions of the *panniculus carnosus*. The three animals were killed seven hours after they had been fed. In that which was not operated on at all, the stomach contained a grayish mucilaginous fluid, without any grains—the small intestines a yellow mucosity—the cœcum a large quantity of altered and unaltered grains. In the animal which was galvanized, the stomach contained a small quantity of fluid and some altered

grains—and the rest had passed entirely into the cœcum, where the grains were partly soft and chymous, and partly connected in balls. In that whose nerves were divided, but which was not galvanized, the stomach contained a large quantity of clear yellow liquid, and three times as many grains as in the second, and of these the greater part was unaltered, the remainder half digested—the cœcum contained merely a watery fluid and shreds of chaff, manifestly the residue of a former digestion. It is evident, that in the last animal, none of the oats on which it had fed immediately before the operation, had passed the pylorus—while the whole aliment in the unoperated animal, and at least two-thirds of it in that which was galvanized, had been transmitted into the intestines. The same experiment was repeated with similar results on the dog—and, consequently, we may now consider the statement first made by Wilson Philip, regarding the effect of galvanism in carrying on digestion, as firmly established. Of course, however, the establishment of this fact by no means establishes the inference he proposed to draw from it, as to the identity of galvanic electricity with the nervous fluid.—*Edinburgh Med. & Surg. Journ. April* 1824.

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*Elementary Structure of the chief Animal Tissues.**—This thesis consists of a variety of interesting microscopical observations on the elementary structure of the tissues, by a young Englishman, brother of Dr. Edwards, the well-known physiologist. The tissues which he has examined are the cellular, serous, mucous, muscular, tendinous, dermoid, nervous, and the coats of the vessels. The cellular tissue had been examined microscopically by Fontana alone, who describes it as consisting of tortuous cylinders, less than the finest red vessels. Dr. Edwards finds, that under a powerful microscope, the supposed cylinders are really lines of globules about 1-7600th part of an inch (1-300th of a millemètre) in diameter—that these lines are sometimes straight, sometimes bent, sometimes tortuous—are separated from each other by an obvious interval, which allows the subjacent layer to be seen betwixt them—cross each others' course irregularly in every direction, and pass from one layer of the membrane to those above and beneath. This structure is precisely the same in man as in the dog, cock, frog, and carp—which were chosen as examples of the different classes of animals. In the peritoneum, in the mucous chorion, and in the conjunctiva, the size and arrangement of the globules is almost exactly similar. The author hints, that the free space, which exists between the lines of globules in each layer, accounts for the per-

* Thèse soutenue à la Faculté de Médecine de Paris, par H. Milne Edwards.

meability of the cellular and serous membranes, lately maintained by M. Fodéra. The researches of Dr. Edwards on the muscular tissue, confirm the statements made regarding it by former observers. A filament of the *biceps crucis* muscle was chosen for examination—it proved to consist of globules of the same size as in the cellular tissue, united in lines of various lengths, very nearly straight, and almost parallel with each other—and each line constituted an ultimate fibril, which could be isolated without changing the relative arrangement of its globules. The size of these globules does not vary with the age of the individual, as Muys alleges—it is the same in the fœtus as in the adult—and both in size and arrangement, they present the same appearance in man, in the sheep, the fowl, the frog, the carp, the lobster, and the beetle. The tendinous tissue, according to Fontana, is composed of fine threads, disposed in parallel, but undulated lines. Dr. Edwards confirms this description, and adds, that the lines consist of globules of the same size as in the textures already mentioned. The only difference he could discover betwixt muscle and tendon is, that in the former the lines are straight, and in the latter undulated. The structure is identical in the round and flat tendons. The dermoid tissue consists of globules still of the same size, and arranged pretty nearly as in the tendinous tissue—the parallelism of the lines is not quite so exact. The observations on the coats of the arteries and veins are important. The external coat, being cellular tissue, has of course the same structure as that texture in other parts of the body—the inner coat is similar to the mucous tissue—and the middle coat precisely the same as the tendinous, aud not composed of straight fibres, like the muscles—it is the same both in the arteries and in the veins, but in the veins it is very thin, and exists only in the large trunks. Several microscopical observers have investigated the elementary structure of the nervous tissue—but the most accurate previous researches are those of Mr. Bauer, published not long ago by Sir E. Home. According to Mr. Bauer, it consists of globules of three different sizes, arranged in parallel fibrils, exceedingly fragile, and united by a transparent elastic gelatinous-like fluid. Dr. Edwards confirms the greater part of these facts—but he finds the globules to be all of one size, namely, the same as that observed by him in the globules of the other tissues. He also believes, that an adipose matter is interposed between the lines of globules—"for when a bit of nervous substance is crushed between two plates of glass, drops are disengaged, which are easily recognized to be fat." No difference exists between the cineritious and medullary matter, in the number, size or arrangement of the globules—and the nervous structure is the same in the brain, in the

nerves, and in the spinal cord of all the animals which were examined. The general conclusions, which the author deduces from his observations are, that the size, form, and disposition of the elementary particles, are the same in all animals, and that their form and size are likewise the same in all the (soft) textures of the body.

On the accuracy of Dr. Milne Edward's microscopical researches, we shall not venture to offer an opinion—we presume no person is entitled to do so, who has not examined the same subjects with the same care, and with the same habits of observing with which he appears to have laboured. We can safely say, however, that his memoir contains nothing to excite distrust—he does not begin it, (according to the general practice of the nation where he has fixed his residence,) by undervaluing and setting aside the labours of all former physiologists—and it is written in a spirit of unostentatious good faith, which his adopted countrymen would do well to imitate, and which cannot fail to win the confidence of the reader.—*ib.*

Physiology of the Urinary Secretion.—It is acknowledged that the physiology of secretion is involved in deep obscurity. Some think that the glandular organs merely strain or separate the fluids from the blood—others believe that entirely new products are formed in the secerning vessels, and that no part of the peculiar secretion previously existed in the blood. A third party conceive that the *elements* of the various secretions preexisted in the general circulation, and that they are combined, each according to its kind, in the glandular apparatus appointed for that purpose. This appears to be the more probable doctrine.

In respect to the urinary secretion, it is well known that in general, there are between twenty and thirty different ingredients in it—but its characteristic component part is termed urea, a gellatinous animal substance always present in healthy urine.

It was to ascertain the state and comparative proportion of this in the blood, that Messrs. Prevost and Dumas have made many experiments—or rather repeated those previously made by M. Richerand—namely, the extirpation of the kidneys from dogs and cats, rabbits not being found to bear these experiments well. One kidney is to be removed first, and when the wound is healed, (about fifteen days,) the other organ is to be taken away. The health is nowise affected by the first operation. In about three days after the removal of the second kidney, copious liquid brown stools, and vomiting of the same materials occur, with great disturbance of the system, as rapid and small pulse, short and laborious respiration. The animal dies between the fifth and ninth day. On dissection, effusions of

clear limpid serum are found in the ventricles of the brain—the bronchiæ filled with mucus—the liver inflamed—the intestines containing liquid fæces—the urinary bladder strongly contracted.

It was estimated by our authors that a dog in health formed a drachm of urea daily, and it was found that five ounces of blood from a dog which had been deprived of its kidneys, yielded more than a scruple of urea. The experiments of these gentlemen lead them to believe that the urea is *eliminated merely* by the kidneys, in proportion as it is formed—and consequently that it accumulates in the circulation when the kidneys are removed. In this case, therefore, we must suppose that the urea is formed independent of the action of the kidney. *Where* it is formed, is not yet ascertained. It is known that in certain diseases of the liver, the urea disappears from the urine. If we apply this doctrine to diabetes, we may suppose that the saccharine matter is formed elsewhere than in the kidneys, and merely thrown off by them in solution.—*Medico-Chirurgical Review, March* 1824.

The Circulation.—Is it certain that the ancients considered the arteries to be the conductors merely of the animal spirits? How does the following passage, Pauli Æginetæ, quadrate with this opinion?

"Hæ arteræ vero oblonga sunt vasa velut venæ, et duas tunicas habent, tum propter relatum motum, tum quod *sanguinem et spiritum* continent: et enascuntur ex corde, et disperguntur per omnes corporis partes."—*De Pulsibus, cap.* xii. *ib.*

MORBID ANATOMY.

*Expulsion of a Portion of Intestine per Anum.**—It is now pretty clearly ascertained that an *invaginated* portion of intestine may become sphacelated at its extremities, detached from its place, and discharged from the body, without necessarily destroying life. The following appears to be a sufficiently well authenticated case of this kind.

L. B. four years of age, of feeble constitution, but lively and healthy, was seized with small-pox on the 23d July, 1820, and took no medicine till the 4th of August, when Dr. Legoupil was summoned, in consequence of the child having, for some days, complained much of violent colicky pains in the belly, accompanied by much dscharge of blood per anum, but no vomiting or hiccup. Our author found the abdomen slightly distended—the right iliac region being more tender and de-

* Journal Général de Medecine, vol. 73.

pressed than the rest. The breathing was natural—the pulse strong and quickened. The pustules were beginning to dry off—and there was a disagreeable putrid smell about the child's bed. The same day there appeared at the anus a purplish red tumour, the size of a pullet's egg, from the surface of which some drops of blood issued. It was supposed to be prolapsus of the mucous membrane of the rectum, and fomentations were applied. On the fifth, the tumour exhaled a putrid odour, the stools passing in a liquid state. On the 6th, 7th, and 8th, the same state continued—but on the 9th the swelling burst forth, drawing after it a cylindrical body, resembling a piece of small intestine, and about six inches in length. This substance was carefully examined by Drs. Legoupil and Delisle, and afterwards sent to the Societé de Medecine de Paris, where it was recognised to be the entire of the cæcum, and about six inches of the ileum. The child recovered and did well.

Another case, still more remarkable, has lately been presented to the Royal Academy of Medicine, by Larrey, Roux, and Beclard.* The patient, after labouring for twelve days with symptoms of internal strangulation, as obstinate constipation, fæcal vomitings, hiccup, abdominal pain, tumour in the right iliac region, &c. discharged a portion (supposed) of intestine and mesentery thirty French inches in length. The patient now recovered, with the exception of a painful sensation remaining in the right iliac region. He died three months afterwards of peritoneal inflammation—but leave could not be obtained to open the body.

In these cases nature effects a junction of the sound intestinal tube, by uniting the upper and lower extremities.—*ib.*

Table of Organic Changes resulting from Inflammation.—M. Villerme has recently published the following arrrangement of the morbid effects of inflammatory action, which he conceives to be more methodical, and more in conformity with their natural connexion and successive development, than any hitherto contrived.

1. *Lesions, or immediate alterations.*—Unusual accumulation of blood in the minute vessels—redness and tumefaction of the inflamed parts—greater consistence of those which are soft.

2. *Lesions, or organic changes, which are terminations of inflammation.*—Augmentation of volume—hardening—hepatization—dropsy—serous infiltration—opacity of tissues which are naturally transparent—suppuration—false membranes—purulent infiltration—purulent drains—abscess—deposition by congestion—vesication—softening—fleshy excrescences—narrow

* Revue Medicale for August 1823.

ing and obstructing of vessels and canals--adhesions, 1st, between surfaces naturally free (serous and mucous,) obliteration of serous cavities, bridles or bands traversing them—obstructions—2d, adhesion between accidental surfaces—cicatrization by the first intention—cicatrization by the second intention, with or without destruction of parts, (false membranes.) Erosion, or ulceration—perforation—gangrene—hospital gangrene—-scirrhus—fungus hæmatodes—some other morbid structures not yet well understood. Cancer—tubercles, 1st, scrofulous, 2d, of serous membranes. Accidental tissues, having something analogous in the economy, cartilaginous and cartilagineform, (*cartilageniforme*,) osseous and ossiform, (*ossiforme*)—fibrous and resembling fibrous, (false joints)—mucous (membrane of fistulous openings)—dermoid, serous, (cysts)—cellular—particular monstrosities—congenital acclusions, &c. Sanguiferous vessels of new formation or creation—organization of the fibrin of the blood, of pus, of false membranes, &c. and conversion into laminated, serous, &c. structures—accidental organs, apoplectic cysts, &c. membranous canals of fistules—synovial capsules of false articulations.

3. *Changes which are the remote consequences of inflammation, and which are not effected until this has already ceased.*—Return of parts to their natural state: restoration of obliterated cavities—restoration of the obliterated medullary cavity of a bone—reproduction of the marrow and medullary organ—return of canals and vessels to their ordinary dimensions—reproduction of fat.

It is sufficient, (adds M. Villermé,) when we have a tolerably profound knowledge of pathology, to glance at this table, in order to perceive how numerous and varied are the organic changes of structure which constitute the subject of this article. It will be at once recognised that there are some so intimately allied to inflammation, that we cannot imagine this to exist without them—others accompany inflammations, marking their intensity, their duration, specific character, their scite and particular tendency, &c. while others are not to be found until the inflammatory action has passed away. The first are the inflammation itself—the second mark, by their formation, the actual existence of the inflammation—and the third show that it has ceased.—*Jour. General, Decembre.*

SURGERY.

Aneurism of the Aorta opening into the Trachea.—M. Andral, Jun. regards this case as remarkable—inasmuch as there was no aneurismal sac, properly speaking, but a mere augmentation in the capacity of the artery, to such an extent as to admit the fist—and, at the same time, a remarkable increase in the

thickness of its coats. It was by a kind of ulceration of the tunics that the perforation of the vessel appeared to have taken place. This dilatation had not been attended with any remarkable symptom during life, excepting an indefinable rattling (*bruissement*,) towards the upper part of the sternum. The patient perished by a tremendous hemorrhage. There was also, in this case, a considerable emphysema of the lung on one side—the existence of which M. Andral recognised during life, by the signs indicated by M. Laennec.—*Revue Medicale, Decembre.*

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*Carbuncle.**—Mr. Blackadder, in his valuable treatise on hospital gangrene, has recommended the application of escharotics in cases of carbuncle. Mr. Swallow was called in by Lord Clermont for a well-characterized affection of this kind, situated on the back of the neck, over the cervical vertebræ. He had but just recovered from a similar attack under the able care of Mr. Guthrie of London. Mr. Swallow immediately made a deep crucial incision through the whole extent of the carbuncle, and filled up the incised spaces with dossils of lint well moistened in equal parts of the liq. arsenicalis and water, the fluid application being renewed every hour or two. After twenty-four hours' application, a slight eschar began to form, the surrounding inflammation and pain evidently diminishing. Twelve hours longer continuation produced a sufficient eschar, and the pain and inflammation ceased. A common poultice was then applied frequently till the eschar separated and left a clear wound which was easily healed.

Mr. Swallow, who had charge of three large hospitals in Spain, appropriated solely for hospital gangrene, never saw any ill effects resulting from the application of arsenic in the gangrene abovementioned. The quick formation of the eschar, he believes, prevents the absorption of the deleterious substance.—*Medico-Chirurgical Review, March* 1824.

Amputation at the Hip-Joint.—This bold and desperate operation has been successfully performed in September last, by Mr. James Syme, Lecturer on Anatomy in Edinburgh.

The subject was a lad about nineteen years of age, who had necrosis of the femur for some years, attended with great enlargement of the thigh, and numerous openings through which matters of different kinds were poured out. The swelling extended to within an inch of the trochanter major—emaciation was making rapid progress—and the lad's destruction seemed inevitable, unless an operation was risked. The steps of the

* Mr. Swallow. Med. and Phys. Journal for September 1822.

operation we find it so difficult to abridge, that we shall give them in the author's own words.

"Having with some difficulty placed the patient upon a table, so that the affected limb was perfectly free, and ascertained that Mr. Liston was ready to make pressure when and where required, I introduced a narrow knife, about a foot long in the blade, which was sharp on one edge only, at the proper place for transfixing the limb—but being prevented by the bent position in which, owing to long habit, the patient obstinately retained it from passing onwards in the direction of the tuberosity of the ischium by the neck of the femur, I lost no time in the repetition of fruitless attempts, but instantly changed my plan.

"Without removing the point of the knife, I brought down its edge obliquely, and by a sawing motion, quickly cut back, in a simicircular direction, to the tuberosity of the ischium, up along the femur, and round the trochanter major, so as to form very speedily indentically the same flap which would have resulted from the plan I meant to have followed.

"While Mr. Liston covered the numerous cut arteries with his left hand, and compressed the femoral in the groin by means of his right, I gathered together all the mass of undivided parts on the inner side of the thigh with my left hand, and then insulated the neck of the bone by passing the knife close past its lower surface. I now cut close down along the bone for some way below the trochanter minor, and lastly, made my way outwards obliquely, so as to form a good internal flap.

"Mr. Liston holding aside the flaps, I made a single cut with my long knife upon the head of the bone, which started with a loud report from its socket as soon as abduction was performed. Finally, I passed the knife round the head of the bone, cut the triangular and remaining portion of capsular ligament; and thus completed the operation, which certainly did not occupy, at the most, more than a minute.

"I then proceeded without delay to take up the arteries, which were tied by our very promising pupil, Mr. Thomas Evans.

"As soon as the femoral, which had been completely commanded by pressure in the groin, was secured, Mr. Liston relaxed his hands in order that we might form some estimate as to the size and number of bleeding vessels—and then, had it not been for thorough seasoning in scenes of dreadful hemorrhage, I certainly should have been startled, prepared as I was to expect unusual vascularity, owing to the extensive action so long carried on in the limb.

"It seemed indeed, at first sight, as if the vessels which supplied so many large and crossing jets of arterial blood could never all be closed. It may be imagined that we did not spend

much time in admiring this alarming spectacle. A single instant was sufficient to convince us, that the patient's safety required all our expedition—and in the course of a few minutes, hemorrhage was effectually restrained by the application of ten or twelve ligatures.

"The flaps were now brought together, and retained in contact by means of five or six stitches. Some dry caddis was laid over the wound—and lastly, I applied a single-headed roller obliquely round the body and stump, moderately tight, so as to afford proper support to the flaps—and then we lifted into bed the patient, who was wonderfully little exhausted."*

The operation was performed at mid-day. Nothing particular occurred till the evening, when so much pain was complained of, that Mr. S. loosed some of the stitches, and allowed some clots of blood to escape. He was very low in the night, with occasional vomiting, which continued next day, till an opiate injection was prescribed. On the third day the wound was examined, and looked well. The opiates were dispensed with after the first week—the bowels were brought into a good state by the occasional use of turpentine injections—the appetite—sleep—pulse, continued to improve—in short, every thing went on well, till about a month after the operation, when symptoms of ascites made their appearance, and in spite of all their efforts, carried the unfortunate patient to his grave, after his heroic sufferings. On dissection, the liver was found altered in structure, and much enlarged. The spleen was greatly enlarged. We are ready to accord our humble mite of praise to the boldness and dexterity of the operator and his able assistants. They deserved success—in fact, we consider the operation as perfectly successful. The final event no human power could controul.—*ib.*

Amputation.—Mr. Syme of Edinburgh, who so successfully amputated at the hip-joint, has offered some remarks on amputation generally, in the last number of our respected cotemporary of the North. If the following be the present practice of the Edinburgh surgeons, a censor in that metropolis appears necessary. "The manner of proceeding here, as every surgeon knows, is first, to dissect back the skin for some inches—then to cut the muscles as high as they are exposed—and lastly, to remove the bone as far up as the retraction of the flesh will allow." We can only say that no such practice is followed by any good modern surgeon on this side of the Tweed. Twenty or thirty years ago, indeed, we have seen the skin and cellular membrane turned up about an inch and half, like the cuff of a coat, and then the muscles divided down to the bone, by one

* Ed. Journal, No. I. p. 23.

circular incision. But this practice has long been abandoned In the thigh, for instance, the circular incision reaches the muscles, and then the integuments retract, and are assisted in retraction—but not separated by dissection from the muscles underneath. Another circular incision, with the edge of the knife slanting upwards, divides the superficial muscles. These being allowed to retract, a third slanting circular is made to the bone, which is insulated an inch or two, and then sawn through. The limb thus removed presents the form of a cone, with a cylinder of bare bone at the apex. It is manifest that, in this way, an excellent cushion of muscle, and a sufficient covering of skin are left for the formation of a good stump. Such is the English practice, and certainly it forms a great contrast with that of Edinburgh, as represented (we hope somewhat in caricature) by Mr. Syme. The practice of the French surgeons—at least of their head—M. Dupuytren—is still worse than the Scotch. "M. Dupuytren cuts all the soft parts at once to the bone, which he next removes, after retracting the muscles to what he considers a sufficient extent. But here he is not particular, as on most occasions he makes no attempt to obtain union by the first intention. Indeed I have seen him dress the bone all round with dry *charpie*, previous to approximating the edges of the stump, for it was seldom possible to bring them into contact." After condemning all forms and modes of amputation by circular incisions, our author goes on to recommend the flap operation. This operation, we are aware, is very useful, and even necessary on some occasions, as in the leg and at joints. But we doubt much whether it will ever come into universal practice in every kind of amputation, as Mr. S. recommends. We shall give Mr. Syme's directions, however, on the subject.

"Lisfranc recommends a long very narrow knife, sharp on both edges—but I think the one used by Mr. Liston better calculated for the purpose. It is about six inches in length, and five-eighths in breadth, thin and blunt in the back, except for an inch from the point, which is very sharp—the back is straight and so is the belly, except about an inch and a half from the point, which is slightly convex.

"The dimensions which I have stated are fully sufficient for the arm and fore-arm, the leg, and all amputations in children; for the thigh of an adult, a greater length will of course be required.

"The surgeon grasping the limb with the left hand, at the place where it is to be removed, ascertains the situation of the bone by means of his thumb. He then introduces the knife over the bone at that part where he wishes to apply the saw, and perpendicularly to it, he passes close by its side, and so on

until the point appears directly oposite.* This finishes the first part of the operation, or the transfixion, as it is called—after which, he cuts his way outwards, in a line forming an angle with the bone more or less acute according to the circumstances, so as to complete one flap.

"He then embraces the remaining undivided parts with his left hand, and gathering them together, passes the knife on their side of the bone, so as to insulate it completely. Removing the restraint of his left hand, he now forms a second flap in the same way as he did the first.

"If there is only one bone, he immediately divides it, his assistant holding aside the flaps with his hands as high as it is exposed—if there are two, he separates the interosseous substance, and does the same thing—thus finishing his operation, which, with reasonable haste, and without the smallest hurry, need never occupy more than half a minute at most."—*Ed. Journal.*

For many good remarks on removing fingers, toes, &c. we refer to Mr. Syme's paper.—*ib.*

Tourniquets in Amputation.—The force and velocity of the arterial circulation are greatly over-rated even to this hour—but the danger of hemorrhage in amputation is gradually losing its influence over the minds of surgeons, notwithstanding the glowing colours in which it has been painted by the late John Bell. In amputating at the shoulder joint and high up in the thigh, we fearlessly operate without a tourniquet—why not do the same when the removal of the limb is lower down, and when, of course, the vessels cut are smaller?—When a tourniquet is applied, we do not arrest the circulation in both arteries and veins at the same time. It is evident, from the engorgement of the limb, that the parts below the tourniquet contain a great deal more blood than they did prior to its application. All this is lost to the patient—and it is far more, we think, than would be lost in amputating without the tourniquet—for by compressing the artery with the finger we diminish the arterial circulation, without offering any impediment to the return of blood by the veins. Hence, in this way, the limb to be removed contains less blood than natural After the removal of the limb there is generally more blood lost while screwing and unscrew-

* "There is some difference of opinion as to whether this first flap should be formed from the external or internal side of the limb. But as this seems to me a matter of perfect indifference, unless in reference to the operator's convenience, I would advise the surgeon, unless he be ambidexter, always to pass the knife, in the first instance, on that side of the bone which corresponds with his right hand as he stands before the patient."

ing the tourniquet, than while tying the vessels without the aid of more pressure than the fingers can supply. These arguments and objections are well maintained in a short paper on the subject, by that able and bold operator Mr. Liston, of Edinburgh, in the last number of our respected cotemporary, the Edinburgh Journal.—*ib.*

Varicose Veins.—On the 13th of November, 1823, M. Richerand read a short paper, at the Academy of Surgery, on the cure of varicose veins. For some time past the professor has been in the habit of curing this state of the vessels by a simple longitudinal incision of some inches in length, applying charpie to the wound to prevent healing by the first intention, and to secure suppuration. By this operation the vessels are emptied of the partially coagulated blood with which they are filled, and become entirely obliterated, without any inflammation spreading along the internal surface of the vessels, as is sometimes the case when they are tied or simply cut across. The pain of the operation is by no means severe. M. Richerand refers the Academy to cases which have been cured in this manner by himself and others.—*ib.*

THEORY AND PRACTICE OF MEDICINE AND MATERIA MEDICA.

Observations on the Use of Iodine in Medicine.—Dr. J. G. Kolley, physician at Breslau, has published some interesting remarks on this subject—the results of his experience have led him to the following conclusions:—

1. Iodine, in the form of tincture, prepared after the formula of M. Coindet, appears to exert a deleterious influence on the nervous system. It gives rise, in persons of sensible habits, to disagreeable accidents, even in doses of a few drops: these symptoms may degenerate into violent spasms. Such persons experience, after a few doses, a degree of restlessness in their limbs, which prevents them from remaining in the same position. The result of this is a feeling of lassitude and weight—violent head-ache, tremors, depression, moroseness, spasm, paleness of the countenance, tears, and great anxiety of the chest. They frequently have a particular dislike to the medicine. As to the rest, these symptoms are entirely different from those proceeding from their being saturated with the iodine.

2. Persons who are disposed to congestions about the head, or any other important organ, who are of robust constitution, muscular frame, well fed, and with the appearance of the bilious temperament, bear iodine ill—at least, if purgatives are not

exhibited at the same time. In these the congestions increase —the head becomes deranged, and cephalalgia comes on to a violent degree.

3. Whenever the digestive organs are not perfectly healthy, having a disposition to cardialgia and colic, the iodine must be given with much caution—otherwise, severe dyspepsia, with violent pain of the stomach, is apt to be induced.

4. All febrile and inflammatory affections absolutely prohibit the use of iodine, be they local or general.

5. The same holds good with regard to the disposition to diarrhœa, local affections of the urinary organs, *phthisis pulmonalis,* local affections of the lungs, stomach, liver—and, generally speaking, all those diseases of internal organs which are liable to terminate in suppuration. In persons who live on very nutritive diet, and who drink much wine, the iodine often excites fever and hemorrhage. Hectic diseases likewise contraindicate its employment.

Iodine, on the other hand, is indicated—

1. In those patients who exhibit no symptoms of excess of sensibility.

2. Where there are no active congestions, and where the venous system does not predominate.

3. When the digestive system is sound.

4. When there is no fever nor tendency to diarrhœa, nor any of those morbid conditions specified above—and when the patient is well nourished without overloading the stomach.

The observations of Dr. Kolley incline him to the internal use of iodine, in the form of tincture—in which way it has appeared to him to be very powerful in the cure of goitre and scrofula. To insure its success in the former of these, it is recommended to ascertain the following circumstances:—1st. That the swelling really exists in the thyroid gland. 2d. That there is not too considerable a degeneration—that the goitre is neither scirrhous nor carcinomatous—and that it does not contain either calcareous concretions or similar productions. 3d. That the tumour is not of too long standing. 4th. That there is neither cachexy nor hectic fever, nor saburræ in the primæ viæ, nor any alteration in the mass of the fluids. 5th. That the goitre itself be not inflamed and painful.—*Archiv für Medeziniche Erfahrung.*

Dr. Kolley's *case of Goitre in his own Person, treated with Iodine.*—Scarcely had the account of this medicine been published, when Dr. Kolley resolved to try it for a goitre of considerable size, and of ten years' standing, which had already resisted all the supposed remedies of this disease. His respiration was much impeded—he could neither walk quickly, nor

for any considerable length of time—he could not go up stairs without difficulty, nor exert his voice. To these symptoms were added frequent and violent congestions about the head. During the employment of the Iodine, he scrupulously followed the prescription of M. Coindet (ten drops of the tincture three times a day in syrup,) for a fortnight: this dose was taken without any inconvenience. During the second fortnight, he experienced disagreeable effects from the increase of the gland —his respiration became very much oppressed, his voice hoarse, the tumour indolent, the congestions violent—he had an unpleasant taste in the mouth, and his appetite fell off. He did not perceive that the excretions were changed. Next fortnight the gland diminished, and disappeared almost entirely in the space of twelve weeks, during which he continued the medicine without intermission. The lower lobe of the right side alone retained some degree of hardness, and the difficulty of breathing disappeared as much as the conformation of his chest permitted. He did not perceive any increase, either in the alvine evacuations, the urine, or perspiration—but he had diarrhœa during some days, having taken forty drops of the tincture at a time. He had no pain at the stomach, though his appetite was somewhat impaired—and he had frequent headach which he attributed to congestion. In short, though he continued the use of iodine for three months, he perceived none of the symptoms attributed by M. Coindet to what he has called the period of saturation. He did not lose flesh.—*ib.*

Effects of Iodine in Scrofula.—The physician, whose case we have given above, has found the combination of iodine with mercury and tonics extremely useful in all very inveterate cases of scrofula, particularly in ill-grown children, with pale flaccid skin, and with the mental faculties but little developed, the belly large, the limbs crooked, the glands of the neck, axilla, and mesentery enlarged—in whom there existed at the same time, a disposition to continual suppuration, without the discharge removing the glandular swellings—in whom the employment of internal and external remedies induces the sores to heal, but which soon break out again. In all such cases iodine, given alternately with calomel and tonics, produced great benefit. The tumours diminished in size, and finally disappeared—the suppuration in the glands ceased—the functions of the alimentary canal became reinstated, and the colour of the skin improved. Similar benefits resulted in local strumous affections, as ophthalmia and various eruptions. Dr. Kolley has frequently seen cases of this kind, of long standing, and hitherto regarded as incurable, permanently disappear under the use of iodine.

The diet recommended by this writer is analeptic, and taken from animal substances, but extremely rigid—particularly in cases of dartres, in which the patients are not allowed to take wine, spirits, nor even beer, but to drink abundance of water, and always to eat so little that a feeling of hunger remains—while they are to keep in a moderately elevated temperature.—*ib.*

Convulsions, caused by Worms, cured by injecting Tartar Emetic into the Veins.—Dr. Meplain, of Donjon, in the department of the Allier, is the author of this interesting case. This gentleman was called upon to visit a girl, twenty-two years of age, of a lymphatic temperament, short and fat, who had suffered from her infancy from attacks of worms, but was in other respects healthy. For upwards of a fortnight previously her appetite had been voracious—yet, notwithstanding she was always hungry, the sight and smell of food disgusted her, and she really ate but little: her nights were disturbed by frightful dreams—in the morning she complained that her mouth was full of a mawkish saliva—she had frequent inclination to vomit. At the termination of a journey in which she had suffered a great deal from cold and damp, she was seized in the evening with a violent attack of fever, with intense head-ach and eructations, wandering pains in the limbs, and great restlessness. The night passed badly, with violent cramps in the legs, low delirium, and grinding of the teeth. The next day, hysterical symptoms, frequent efforts to vomit, convulsions and continued agitation. In the night the patient lost all consciousness—the limbs became stiff. Dr. Meplain found his patient, on the 15th instant, in the following condition:—She was lying on ber back in a state of complete immobility—the eye-lids raised, the eyes fixed, and the pupils contracted—the head completely bent backwards—the jaws forcibly held together, so that they could not be opened by any efforts—the limbs in a state of tetanic rigidity—pulse scarcely perceptible—the skin cold—abdomen soft—and the urine (last passed on the preceding day,) white and milky. Dr. Meplain, from all the previous circumstances, conceived these symptoms to be produced by the presence of worms—being taught, he says, by numerous dissections, that, in these cases, the coming on of convulsive symptoms indicates that the worms have passed into the stomach, and seek an exit by the œsophagus. He therefore attempted, by various means, which we need not detail, for the space of six hours, to bring on the action of vomiting—but without success. He then determined, considering the very critical state of the patient, to attempt the injection of an emetic into the veins. Dr. M. therefore laid bare the median vein of the left arm, which having separated from the cellular tissue, and having passed a ligature

underneath, (interposing a piece of pasteboard between it and the vein,) and drawing it out to the level of the teguments, he pushed the blood contained above the ligature upwards with his fore-finger, and then made a longitudinal incision of four or five lines in the vein, into the cavity of which he placed the canula of an ordinary trocar—this being done, he injected, by means of a hydrocele syringe, six ounces of whey, in which were dissolved four grains of tartar emetic. When this quantity was taken into the vein, the ligature was cut, the vein suffered to fall into its situation at the bottom of the wound, which was brought together and bound up, as is usual after a common bleeding.

The patient gave no sign of sensibility during the operation, which was finished at eleven minutes after two—at twenty-eight minutes after two, the eyes and the lower lip began to move. These details are continued, but at too great a length to permit us to follow them verbatim : suffice it to say, that at forty-two minutes past two, vomiting took place, and eight lumbrici, rolled up in a ball, were ejected—they were all living. The amendment of the condition of the patient was striking: the rigidity of the limbs had ceased—she could swallow, but could not speak—the pulse was stronger, but intermitted, and she appeared to be fainting. At fifty-six minutes after two, she vomited again two lumbrici of a larger size—after which she began to articulate, complaining of a sense of heat in her chest, of a violent head-ach, and a sense of uneasiness which she could not describe. From that moment the condition of the patient presented nothing remarkable. She vomited several times afterwards, bringing up, together with a prodigious quantity of bile, five more lumbrici. For three days after the patient suffered much general disturbance of the system, head-ach, thirst, &c. but the menses appeared on the 18th, and on the 20th she was quite recovered.—*Journ. Comp. des Sciences Medicales, Fevrier.*

On the Action of the pure Meconic Acid, and its combinations with Potash and Soda.—A great difference of opinion having existed on the continent with regard to the action of the pure meconic acid, as well as the meconiates of potash and soda, on the animal economy, Dr. Fenoglio, together with N. Cesare and Donenico Blengini, of Turin, have performed several experiments in order to discover the real power of these substances. It had been said that two persons had fallen victims to very minute doses (a grain) of the pure meconic acid, given as an anthelmintic—whilst, on the other hand, it had been taken by M. Suertuerner to the amount of five grains without inconvenience—and M. Sœmmering administered as much as ten

grains of the pure acid, as well as the meconiate of soda, to dogs, without the least sensible effect. The experiments of Dr. Fenoglio prove distinctly that doses of eight grains of these salts, or of the pure acid, produce no deleterious effects on dogs, crows, or frogs—some of the animals experimented upon being suffered to live, and others afterwards destroyed by prussic acid. The same experiment was afterwards repeated on a horse—eight grains of the pure acid, of the meconiate of soda and of potash, being given separately, and at the distance of a few days from each other, to this animal, without any marked effect being produced. It only remained now to ascertain the effect of these substances in the human subject—and on the 15th of May, 1822, the opportunity was offered of exhibiting them to two sisters afflicted with tænia. The first, twenty-one years of age, took four grains of meconiate of potash—the second, aged nineteen, took four grains of meconiate of soda. These medicines had no sensible effect—not producing the expulsion even of any portion of the worm, which was afterwards got rid of by Madame Nouffler's remedy.

In a foot-note annexed to this article, Dr. Fenoglio attributes, with every appearance of truth, the death of the two individuals abovementioned to the presence of morphia, from a defective preparation of the substance employed—and the account he gives of the symptoms that preceded their death gives great weight to his opinion.—*Annali Universali, November.*

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*Diabetes.**—Dr. Carter is publishing a series of interesting hospital reports in our respected cotemporary, of which reports we shall, from time to time, take some notice. A case is related of diabetes, in a man thirty-three years of age, where the disease resisted various methods of treatment till—"hard work, aided by warm clothing, and a scruple of Dover's powder at night, entirely removed the disease." An inordinate and unhealthy action of any one organ is pretty generally restrained by increasing the function of some other organ. It is evident that the skin, as an extensive outlet, sympathizing powerfully with almost all the glandular viscera, is an important agent in the removal as well as in the production of diseases. Its agency, therefore, should generally be employed in diabetes. Dr. Carter's practice, he observes himself, is not new—but this is of little consequence, provided it is useful.—*Medico-Chirurgical Review, March* 1824.

Injection of Opium into the Veins.†—From a great number of

* Dr. Carter. Med. Repos. 119.

† Charles W. Coindet. Revue Medicale, Juillet, 1823.

observations and reflections on the operation of poisonous substances, M. Coindet comes to the following conclusions.

1st.—That there are but two classes of poisons—the first class comprehends the caustic and irritating substances—the second comprehends all the others.

2d.—That the poisons of the last class when taken into the stomach, possess an intensity of action in an inverse ratio to their nutritive properties.

3d.—That the decomposition of substances in the stomach varies with age, sex, health, and disease—in short, with the powers of digestion.

4th.—That the injection of medicinal substances into the veins may be very useful in certain diseases where the digestive function is so energetic that the said medicaments would be quickly decomposed in the stomach, and consequently prevented from entering the circulation unchanged, and acting on the system according to their peculiar properties.

The following remarkable case will illustrate these conclusions.

In December 1819, M. Coindet was called in consultation with M. Herey, to Jean Paterson, a young girl of fourteen years, who was said to be labouring under violent tetanus. Three years previously, having been frightened by a dog, she fell into a nervous state, which soon assumed the form of well-marked hysteria. During four months the attacks took place every day at irregular hours. The catamenia now appeared, and the hysteric paroxysms ceased. The catamenia became obstructed, and the hysteria returned in the following manner. While sitting one day at dinner, she was suddenly seized with rigid locking of the jaws, and in a few minutes afterwards, became insensible. In two or three days the spasms extended from the head to the trunk, and assumed the appearance of real tetanus—still she remained insensible. In this state she had continued a week when our author first saw her. Various medicines were tried, but with little effect. The disease gradually ceased in about three weeks. In the middle of January 1820, M. Coindet was again called to her, and found the same symptoms as before described, but in more aggravated form. The spasms were more violent than in the majority of cases of idiopathic tetanus. They commenced very irregularly in attacks of emprosthotonos—the head sometimes coming with violence against the knees. Opisthotonos succeeded—the body took the form of an arch, and rested on the heels and occiput. In these paroxysms, which sometimes lasted twenty minutes or more, the whole muscles of the body participated in the painful tension. The respiration was embarrassed—the pulsations of the heart became feeble and irregular—and the poor

girl was threatened with suffocation! This horrible agony was broken up by some brisk convulsions, and succeeded by an interval of tranquillity. This succession of paroxysms had now lasted three weeks, and was increasing in degree when M. Coindet visited the patient. Her ordinary attendant had administered as much as an ounce of laudanum for a dose, without producing any effect on the system, which led our author to suppose that the remedies were decomposed in the stomach, and did not reach the circulation unchanged. It was therefore determined to inject a solution of opium into the veins. A scruple of opium was dissolved in distilled warmed water, and then filtered. There was a residue of twelve grains on the paper, but the narcotic principles were almost all in the solution. In the presence of several medical gentlemen, an opening was made into the vena basilica of the right arm, and the point of a fine syringe introduced, when a drachm was injected every five minutes, taking care not to allow any air to pass in, and to move the point of the syringe as little as possible in the vessel. At the *first* injection the respiration became more regular and less rapid—the state of the pulse and the other symptoms remaining the same. At the *second* injection the breathing became quite natural—the pulse rose to 100 and got fuller—the surface became a little elevated in temperature, and soon broke out in a gentle perspiration—the spasms were less violent—and the patient heaved some deep sighs, like a person awaking from sleep. At the *third* injection the pulse rose to 112, stronger and fuller—the skin became more coloured and covered with sweat—the convulsions ceased almost entirely—and she articulated some words indistinctly. At the *fourth* injection the breathing became quicker, and the pulse rose to 120, very full, the skin being red, and the perspiration abundant. At the *fifth* injection the foregoing phenomena were augmented in degree—the sight and hearing were entirely restored, the patient recognising the physicians—she articulated distinctly some sentences, but like a person awaking out of a sleep troubled by dreams.

The operation was not followed by any alarming symptoms. The patient experienced some sickness at stomach in the night, with a little irregularity of breathing and precordial anxiety. The vein also shewed signs of inflammation, which were subdued by repeated applications of leeches and icy lotions in the track of the vessel. The patient described the effect of the injections as if a torrent of liquid fire had been poured through the veins of the arm, concentrating in her chest, and thence dispersed over the whole body, attended with violent heat and pricking of the skin. These sensations, she said, were of a most painful nature. She had a slight return of the spasms four days after the operation—but they readily yielded to the

internal exhibition of opium. After an interval of complete health the disease again returned, but not in so violent a degree as formerly. The use of the bath, and a discontinuance of strong irritating purgatives, which she was in the habit of taking, promptly restored her to health.

The foregoing experiment shews that opium may be injected into the vascular system, without always producing fatal effects —but even in the above case we conceive the young lady ran no small risk from the inflammation of the vein alone. Nevertheless, in desperate cases, as of hydrophobia, or tetanus, this *anceps remedium* may be worthy of a trial.—*ib.*

Constipation of the Bowels.—On the 6th of May, 1822, a paper by Dr. W. Maxwell, was read at the Dumfries Medical Society, and subsequently published in the 78th number of the Edinburgh Medical Journal, on "*Constipation of the Bowels.*" Our author confines his observations to cases occurring without change of structure—dividing them into three sections. First, constipation from indurated fæces—second, from intus-susceptio, and other visceral displacements—and *tertio,* from paralysis of the bowels. It is to the first class, almost exclusively, that Dr M. directs his attention in the present paper, and endeavours to illustrate his subject by cases. The aim of the author appears to be to recommend two remedial agents of paramount power in this disease—namely, large injection of tepid linseed oil—and inflation by air, so as to distend the bowels and obviate the obstruction. In throwing up the oil, there should be a shoulder to the pipe to press on the anus, and prevent the return of the fluid during the operation. The quantity thrown up by Dr. M. is considerable—sometimes three or four pints. He mentions a case where he threw up 3½ gallons of warm water, before it reached the stomach—which, he thinks, it may always be made to do, notwithstanding the valve of the colon. "When a large portion of fluid is forced up by injection, the patient should be placed in a posture that will allow the bowels to hang at nearly right angles with the spine." What this posture is, our author does not say—and we confess we are unable to divine. The practice of throwing up large quantities of fluid, so as mechanically to distend the bowels, is not new, as our readers know—but it is a measure which we think might be more frequently resorted to than it now is.—*ib.*

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*Prussic Acid.**—It is better than two years since Dr. Macleod published some observations on the good effects of prussic acid in some cases of dyspepsia. More extended experience has

* Dr. Macleod. Med. and Phys. Journal, No. 298.

confirmed him in regarding this remedy as of considerable power in those forms of indigestion which are attended with much pain in the stomach and flatulence. Palpitation of the heart is not an unusual attendant on dyspepsia, sometimes simulating angina pectoris. In organic affections of the heart, too, we very generally have symptoms of dyspepsia, which aggravate the original disease. "In such instances of morbid action of the heart brought on by dyspepsia, or of dyspepsia sympathetic of organic disease of the heart, I am inclined, says Dr. Macleod, to think that much benefit is to be obtained from the employment of prussic acid."—*ib.*

Leeches to Internal Surfaces.—In the present volume of this Journal we have recorded the practice of Dr. Crampton, respecting the application of leeches to internal surfaces affected with inflammation. It is but fair now to add, that three years ago, or more, Dr Velpeau of Tours, presented to the public a memoir on the same subject, extracts from which are given in the Nouveau Journal de Medicine, for July 1820. Dr Velpeau observes. that he experienced the most salutary effects from the application of a single leech to the internal surface of the inferior palpebra, in cases of ophthalmia If the leech be applied about a line from the external border of the eyelid, it will leave scarcely any trace of the bite, and produce no ecchymosis—but if it be allowed to fasten on the skin it will do both The author confesses that he took the hint from Demours, who, in his treatise on diseases of the eye, recommends this practice.

P. S. We are informed by a respectable correspondent that Dr. Monro, of Edinburgh, was in the habit of applying leeches through the medium of a silver canulla to inflamed tonsils, in severe cases of cynanche. He mentions this, not with the view of detracting from the merits of Dr. Crampton, but to insure to Dr. Monro the reputation of being the original inventor of the process.—*ib.*

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*Obstruction of the Bowels.**—Dr. Chisholm has related a case of obstinate constipation of the bowels relieved by Read's injecting machine, after various other means had failed. The obstruction had existed three or four days before Dr. Chisholm saw the patient with Mr. Beet, surgeon, at Ashford. When seen by Dr. C. the patient's extremities were cold, and stercoraceous vomiting had come on. A tepid solution of yellow soap was prepared, and more than a wash-hand basin-full was gradually but perseveringly thrown up by means of the instrument abovementioned, and prevented from returning by napkins pressed to the anus. The patient's belly now resembled a

* Dr. Chisholm, Physician to the Canterbury Hospital.

drum. When the injection was allowed to come away, the spectators had the gratification to find it mixed with fæces. Shortly after this the patient passed flatus and stools, and all the bad symptoms quickly vanished. "I have had many other cases," says Dr. Chisholm, "where Read's machine was of infinite service, and I think every medical practitioner should have one in his possession."—*Med. Repos. No.* 1, *New Series.*

Arrest of Salivation.—Surgeon Sommé of Antwerp, asserts that mercurial salivation may be speedily arrested by the use of a gargle composed of one ounce of the superacetate of lead in two pounds of water. This gargle has the disadvantage of blackening the teeth, but it is said to quickly heal those ulcerations of the mouth, which prove intractable under other means. In the ulcers of the tonsils and palate, which occasionally follow mercurial courses, Mr. Sommé touches the parts with a hair pencil charged with the pure liquid of the acetate of lead.*—*Archives Generales de Medecine.*

Purpura Hæmorrhagica.†—It is well known that physicians are divided respecting both the pathology and treatment of this disease—some taking Dr. Parry's doctrine for their creed, and employing venesection, &c.—others viewing the disease as one of debility, and exhibiting the mineral acids, tonics, &c. Latterly some cases have been published where purgatives of oil of turpentine were found beneficial, and Mr. Thomson, of Whitehaven, has brought forward a case in support of this method of treatment.

It was a boy, five years old, whose body became covered with purple spots, accompanied by effusion of blood from different parts—pulse very quick—and other marks of pyrexia present. What was evacuated from the bowels was the same colour as that effused from the eyes and other parts. Turpentine was exhibited in small doses, sometimes combined with castor oil—and with small allowance of port wine. Under this treatment the boy gradually improved. The oil of turpentine was given by Mr. Thomson with the double view of acting on the bowels, and also of being absorbed into the system.—*Medico-Chirurgical Review, March* 1824.

Acupuncture.‡—Mr. Churchill, who published some time ago on this process, informs us that, "its success has now been so conspicuous, that he can assume an air of triumph, and dare any one to express his disbelief in what he has asserted respecting

* This remedy has been employed in the United States for the last twenty years.—Vid. Chapman's Therapeutics.

† Mr. Ed. Thomson Med Repos. No. 119.

‡ Mr. Churchill. Med. Repos. 113.

it." However successful and triumphant may be acupuncture, the above is not the language to announce it in. But it is the language of youth, and time will chasten it. Mr. Churchill has here brought forward three cases of rheumatism cured, or at least greatly relieved by this curious process. The first was a gardener, who had been rheumatic for three or four years, in consequence of exposure to wet and cold. The neck, shoulders, back, and hips, had been occasionally the seat of the pain In the beginning of the present year it lost its erratic character, and became fixed in the deltoid and pectoralis major of the left side. There it resisted all kinds of remedies. "A needle was introduced about midway between the point of the shoulder and the insertion of the deltoid muscle, which pierced through the belly of this muscle until its whole length (one inch) had passed." The patient became sensible of relief before the needle had reached more than two-thirds of its depth, and when the whole way, the pain had entirely left the part. The needle was allowed to remain five minutes, when it was removed, and introduced below the clavicle, so as to pierce the pectoralis. This puncture was as successful as the former. It appears that the man went to work, with only debility of the parts, "and in a week or two felt no remains of the disease."

The second case was one of lumbago. Mr. C. introduced two needles, two inches in depth, into the muscles of the loins, "which in some degree lessened the violence of the pain in a minute or two." Finding that the disease was not removed, but mitigated, he passed a third needle, and a fourth, into the lumbar mass of muscles, and in a few minutes the pain vanished. Mr. C. heard nothing of him for two days, when his daughter called to say he was quite well. The third case is rather equivocal—and at all events the pain had only commenced the same morning in a sudden manner. It might therefore as suddenly disappear under the mental and corporeal impression. We understand that the Earl of Egmont has derived considerable advantage from acupuncture—and therefore we should not be surprised if it become fashionable in rheumatism, which so often resists every means of cure. At the risk of coming under Mr. Churchill's censure, we venture to doubt, not what he has said or done himself, but a similarity of success in the hands of others. Sincerely do we wish, however, that we may be wrong in our anticipations.—*ib.*

Cure of Tinea Capitis by the Chloruret of Soda.—In a letter addressed to the Académie Royale de Médecine, M. Roche announces that he has cured, in the space of three months, a case of *porrigo favosa*, which had continued for nearly eleven years, and had resisted all known means. The remedy was used in

the form of lotion assiduously applied.—*Nouv. Biblioth. Médic. Mars*, 1824.

On the Diagnosis of Bronchial Diseases, by M. ANDRAL, Jun. —In an interesting communication lately published, M. Andral has made some observations on the diagnosis of *dilatation*, *contraction*, and *obliteration* of the bronchia. The first of these states he divides into three varieties. In the *first*, one or more of the bronchia are more or less increased in their capacity. Occasionally the tubes which proceed from the fourth, fifth, or sixth division of the principal bronchus of each, have a diameter equal, if not superior to it. Sometimes this dilatation affects one branch only, at others it exists in several—and sometimes in the bronchial branches of a whole lobe. This species of dilatation ought not, M. Andral thinks, in all cases to be considered as the result of simple passive distension of the bronchial parietes, as they frequently are evidently thicker than in their healthy condition: the mucous membrane is more consistent and denser than common, and sometimes ulcerated: the fibrous membrane, which is ordinarily so thin in the small bronchia, is hard and resisting: and the cartilaginous tissue, which in the healthy condition does not exist, or only appears under the form of isolated grains, is much more apparent. This first variety he therefore considers to be a sort of hypertrophy of the tissue of the bronchial parietes.

When inconsiderable, or to a slight extent, this first variety of dilatation of the bronchi is with difficulty recognised during life. When it extends, however, to a high degree, it is announced by symptoms which are sufficiently characteristic. Thus in one case which he has related, where the greater part of the bronchia of the superior lobe of the right lung were considerably dilated, the voice resounded so considerably beneath the clavicle, and in the sub-scapulary fossa, that the existence of tuberculous excavation might have been credited. Frequently where the dilatation exists, a very marked mucous rattling is audible; a gurgling similar to that of cavities filled with pus: at other times this gurgling is replaced by a sort of distinct wheezing, such as is not uncommonly met with where there are tuberculous excavations not containing any liquids. In a *second* variety, this uniform dilatation does not exist, but an accidental cavity is formed, which in one case, related by M. Andral, was large enough to contain a walnut. The internal surface presented a considerable number of orifices, each leading into a bronchus of an almost capillary diameter. In the parieties of this cavity the texture of the bronchial parietes was readily recognisable: either the mucous membrane, which was continued from the small chan-

nels into its interior, or the fibrous membrane, was much more dense and apparent than in the neighbouring bronchial branches. In this case also, according to the author, it seemed that the cavity of the bronchus was enlarged in proportion as its parietes became thickened, as is observed in certain dilatations of the aorta coinciding with hypertrophy of its membranes.

The diagnosis of this second variety is more or less easy according to the situation and size of the dilatation. It may be either indicated by a true pectriloquy, or by a characterized wheezing, which is audible whenever the air penetrates into the lungs.

Finally, in a *third* variety, the same bronchial tube, dilated at intervals, presents in its length a succession of dilatations and contractions. On incising the parenchyma of the lungs, it is found, as it were, sown with a great quantity of small round tumours, remarkable for their white colour, which they owe to the puriform fluid filling them. On penetrating into their cavity with the point of a scalpel, it is readily seen that these tumours are continuous with small bronchi which, in order to form them, become dilated at short distances. In the cases of this kind which have presented themselves to M. Andral, the bronchia did not appear, as in the two former varieties, to have augmented in thickness in the dilated portions: their parietes were, on the contrary, very thin. M. Andral therefore concludes, that in this last variety the small partial dilatations of the bronchia were only the mechanical result of their distension by mucus in parts where their parietes offered the least resistance, either by diminution of their elasticity, or by actual extenuation. This kind of dilatation would seem, moreover, to be more rare in children than in adults.

The diagnosis of this third variety is said to be almost impossible to be established. It can only be suspected from the long duration of the bronchitis, the characters of the cough, the abundance and nature of the sputa, the different *râles* which may be heard, &c.

Contraction of the Bronchia, to a greater or less degree, is an organic disease less common than their dilatation—like this, the contraction may occupy one bronchial tube only, either partially or in its whole extent, or it may extend to several, and even to the bronchi of a whole lobe. Like dilatation, the contraction may be owing to chronic inflammation of the bronchia, the parietes of which have become thickened—but in some circumstances, it may be also the mechanical result of compression, exerted upon a bronchial tube by tumours of different natures developed in its vicinity. Contraction of the bronchia is announced by symptoms much less characteristic than their dilatation. It often indeed exists without occasioning any particular

phenomenon. There is no symptom which can be considered diagnostic of it.

Of Obliteration of the Bronchia.—M. Andral refers to one case only where the bronchial tubes were destroyed by a melanosis —an occurrence by no means common: with the detail of this case, his interesting pathological article closes.—*London Medical Repository, June* 1824.

CHEMISTRY.

Bodies in a State of Putrefaction.—As the study of anatomy in this country is environed with so many difficulties, it becomes a great object, in every point of view, to preserve bodies, in our dissecting rooms, as much as possible in a state of freshness. M. Labarraque, in a memoir lately read before the Academy of Medicine, avers that a fluid composed of one pound of chloruret of lime in thirty or forty quarts of water, when applied by means of a cloth dipped in it, to bodies in a state of putrefaction, will remove or prevent the fetor. He also proposes the substitution of liquid chloruret of lime for the acid gases commonly employed as disinfecting agents. This, we imagine, is not of very great consequence, as we believe that pure atmospheric air and ventilation are the best and surest disinfecters. Where we have fetid smells covered by acid gases, we are not apprized of the presence of the enemy.

P. S. Since writing the above, we observe a short paper in the Journal Général de Medecine, which bears on the present subject.

M Orfila was consulted by the police whether poison could be detected in a body that had been buried so long as thirty days? He answered in the affirmative, and was directed to exhumate a corpse, and examine it in a medico-legal point of view. The body had been buried thirty-two days, and when exposed to the open air, exhaled such a horrible fetor, that it could not be borne at two hundred yards' distance. After three hours' exposure, the fetor was little diminished, and it was determined to try the aspersion of solution of chloruret of lime. The mephitic exhalations ceased immediately—and Orfila and his assistants were enabled to prosecute the investigation for several hours without inconvenience. Arsenic was incontestibly detected in the intestines. In rendering homage to the merit of Labarraque's discovery, M. Orfila is of opinion that, by means of the article in question, we may proceed without danger or difficulty, to the examinations of bodies that have been several months interred.*—*Medico-Chirurgical Review, March* 1824.

* Journal General de Medecine, August 1823.

Composition of the lately discovered Vegetable Principles.—MM. Dumas and Pelletier have subjected the vegetable alkalis, and some others of the recently discovered principles, to ultimate analysis—and the following table shews the results at which they have arrived. The process employed was that by the deutoxide of copper—and excessive precautions were taken in executing every step of it.

	Carbon.	*Hydrogen.*	*Oxygen.*	*Azote.*
Quina	75.00	6.66	10.43	8.45
Cinchonia	76.97	6.22	7.79	9.02
Brucia	75.04	6.52	11.21	7.22
Strychnia	78.22	6.54	6.38	8.92
Veratra	66.75	8.54	19.60	5.04
Emeta	64.57	7.77	22.95	4.30
Morphia	72.02	7.01	14.84	5.53
Narcotia	68.88	5.91	18.00	7.21
Cafeïn	46.51	4.81	27.14	21.54

It will be seen by the table that all these substances contain a sensible quantity of azote. Notwithstanding the extreme care with which they seem to have proceeded, we confess that this result staggers our faith in their accuracy. Morphia, according to the analysis of Dr. Thomas Thomson, contains no azote—and we may add, that in several very careful experiments performed at Paris by Dr. Christison, under the direction of M. Robiquet, with the view of ascertaining whether azote existed in that alkali, the quantity of azote never amounted to more than a third of a part per cent. It must be evident to those acquainted with the process of analysis by the deutoxide of copper, that the experimenter may obtain more, but never less azote than existed in the substance decomposed.—*Annales de Chim. et de Phys. Oct.* 1823, xxiv. 191.

New Alkali in Jalap.—Mr. Hume, jun. of Long Acre, has just extracted from jalap a substance similar to the recently discovered alkalies of opium, bark, nux vomica, &c. Having procured but a small quantity of this new substance, (for which he proposes the name of *jalapine*,) Mr. Hume is not yet enabled to give any satisfactory account of its chemical properties, nor of its action on the animal economy.

The mode of procuring jalapine is very simple. Coarsely-powdered jalap is macerated, for twelve or fourteen days in strong acetic acid—a high-coloured tincture is thus obtained, which, when filtered, is to be supersaturated with ammonia, and the mixture violently shaken—a sabulous deposit will fall rapidly, and a few crystals will form on the sides of the vessel. The deposit and crystals are to be collected, and washed with distilled water—again dissolved in a small quantity of concen-

trated acetic acid, and reprecipitated by ammonia added to supersaturation, which throws down the jalapine, in small, white, acicular crystals.

Jalapine is without any perceptible taste or smell, and seems heavier than morphine, quinine, or other substances of this class—it is scarcely, if at all, soluble in cold water, and only to a small extent in hot water. Ether has no effect upon it—alcohol is its proper solvent. Very little trouble is requisite to purify jalapine from extractive or colouring matter, for which it appears to have a very slight affinity.

Mr. Hume, jun. operated only upon an ounce of jalap-root, from which quantity he conjectures, that when the process is conducted with greater accuracy than usually attends a first examination, it will be easy to obtain five grains of jalapine.—*Private Letter from Mr. Hume.—Lond. Med. and Phys. Journ. April* 1824.

AMERICAN INTELLIGENCE.

THE *Medical Society of South Carolina*, having organized a SCHOOL OF MEDICINE, agreeably to the powers conferred at the last Session of the Legislature, the following details are made for the information of the public.

The Professors elected are:

	FEE.
JOHN EDWARDS HOLBROOK, M. D. Professor of Anatomy,	$20
JAMES RAMSAY, M. D. Do. Surgery,	15
SAMUEL HENRY DICKSON. M. D. Do. Institutes and Practice of Physic, ...	20
THOMAS G PRIOLEAU, M. D. Professor of Obstetrics and Diseases of Women and Infants, ...	15
HENRY R. FROST, M. D. Professor of Materia Medica,	15
EDMUND RAVENEL, M. D. Do. Chemistry and Pharmacy, ...	20
STEPHEN ELLIOTT, L. L. D. Professor of Natural History and Botany,-	
A Matriculating Ticket to be paid for at the first Session,	5

In order to entitle an individual to examination for a degree, it will be necessary that he shall have attained the age of twenty-one years, be of good moral character, and have studied medicine

for two years with some established practitioner. He shall also have taken the ticket of each Professor for two courses of lectures, or shall have attended one full course at some other respectable Medical School, previously to his becoming a member of this Institution. Students who have for two seasons taken the tickets of any or all of the Professors, shall be thereafter entitled to admission into his or their Lecture Room without farther expense.

The Lectures will commence on the second Monday in November next, and will continue for five months. The Anatomical Lecture Room is lighted from the top of the building, and the seats are elevated sufficiently for the convenience of the students. Arrangements for private dissections are particularly attended to, and every facility afforded for the acquirement of a minute knowledge of the structure of the human frame, and the preparation and preservation of its different parts. The Chemical Laboratory is contained in the same building, and such apparatus procured as is necessary to a full experimental course. The Library belonging to the Medical Society will be opened to the students upon the most liberal terms, and it is only doing justice to that body, to acknowledge that their collection of Medical Works is among the largest and most select in the United States.

The privilege of visiting the patients in the Marine Hospital and Poor-House, affords the best opportunities for the acquisition of practical knowledge, without additional expense. During the daily attendance of the physicians of these Institutions, such clinical remarks are made as are of importance to the medical student.

All operations in Surgery, occurring in these establishments, will be free to the class, in addition to such cases in private practice as may be operated on in the public Institutions.

From the statements made, it appears that every opportunity of acquiring medical information, will be afforded to the southern student by the Medical College of South Carolina, and that at a rate of expenditure very trivial. But some advantages of a peculiar character are connected with this Institution, which it may be proper to point out.

No place in the United States offers as great opportunities for the acquisition of Anatomical knowledge, subjects being obtained from among the coloured population in sufficient number for every purpose, and proper dissections carried on, without offending any individual in the community. Those impediments which exist in so many other places to the prosecution of this study are not here thrown in the path of the student—public feeling being rather favourable than hostile to the advancement of the science of Anatomy.

In addition, the southern student can nowhere else receive correct instruction on the diseases of his own climate, or the peculiar morbid affections of the coloured population.

Charleston, June 19th, 1824.

The city and neighbourhood of Philadelphia, which for the last three years have been afflicted by a series of epidemics, are at present more healthy than we have ever known. The typhoid fever and small-pox of the winter, gradually disappeared on the accession of warm weather, and as yet there is no return of the country fevers. Whatever may have been the cause of these epidemics, it seems to have become exhausted, and we are restored to our former state of healthiness.

The bills of mortality, compared with those of our other cities, independently of other evidence, fully warrant this statement. According to the usual course of epidemics, it is more than probable, that the Eastern States, which have hitherto escaped, will become sickly, and that ultimately, the disease (we mean the autumnal fever) which, commencing in the south, will have spread over this immense continent. An illustration of this law of epidemics, we have had afforded in our late winter typhoid, or spotted fever, which first appearing in the District of Maine, in the progress of a few years extended to New Orleans. —EDITOR.

In our last number will be found a very interesting communication, by Dr. Jackson, and one also in the present number, by Dr. Cress, on the efficacy of cold affusions in relieving the inordinate effects of opium. We were lately called to a child of four months old, to whom had been given a tea-spoonful of laudanum, for the tincture of rhubarb. The mistake was discovered more than an hour afterwards by the stertorous respiration, and heavy stupor which took place. Before our arrival ten drops of antimonial wine had been given, and the child immersed in warm water, by which, moderate vomiting was excited, and with it every unpleasant symptom disappeared. We lay this case before our readers with this single remark, that there can be no doubt laudanum had been given, as we examined the contents of the vial from which the dose was taken.—EDITOR.

We are informed by Dr. Coates, that tartarised antimony, so exhibited as to excite and keep up a slight degree of nausea, is very effectual in the cure of paronychia. It is presumable that it acts here, on the same principle as in odontalgia and tic douloureux, in each of which cases we have several times resorted to the practice with signal advantage—EDITOR.

Coffee, made strong, without cream or sugar, and drank pretty freely, we have found lately, in two instances, to remove the pain and other distresses of nephritis calculosa, as promptly as an opiate, and where the ordinary remedies had failed. By our medical friends, several other instances have been mentioned to us of its striking utility.—Editor.

In preparing quinine, or its sulphate, there is a considerable residue of a thick, viscid, brown substance, that becomes solid after a short period, assuming a resinous aspect. We have not observed, that in any of the European journals, notice has been taken of the medical employment of this matter. In this city it has been prescribed, in intermittents, with decided advantage. Dr. Jackson has treated fifteen cases with it, in all of which the paroxysms were suspended—and thirteen remained permanently cured. The usual mode of exhibition was to give one grain, in form of pill, every two hours, during the day of the intermission, in tertians—and the same quantity every half hour, on the day of the paroxysm, commencing three or four hours before the usual time of the attack. In quotidians, five or six grains may be given every hour, or two hours, during the apyrexia. It appears to be scarcely inferior to the sulphate quinine itself.

This substance Dr. Jackson has examined, and finds it to possess the attributes of the cinchonic bitter and cinchonic red of Reuss. These properties are—cinchonic bitter—a strong bitter taste, solubility in water and alcohol, copious precipitation with infusion of galls, and green colour with ferruginous salts. Second, cinchonic red—is insipid—is of red colour—very soluble in alcohol—nearly insoluble in water—has strong affinity to cinchonic bitter, from which it is difficult to be separated—has affinity for lime and magnesia, and forms precipitates with metallic salts.

The same results are found to occur in the infusions of all the best cinchona barks, when treated with galls, the ferruginous salts, and zinc: they are tests of the superior cinchonas, all of which contain these principles.—Editor.

We shall be much obliged to any one of our professional correspondents, who will forward to us an authentic account of the following extraordinary case. It has excited much attention, and though probably exaggerated in the annexed statement, is still an object of curiosity.—Editor.

Singular Case.—Several months ago the Indiana papers contained an account of a girl of thirteen years of age, from whose face, and under the eye, "clots of blood" would occasionally ooze,

together with pieces of cartilage and bone—and what was most extraordinary, the girl continued in good health, and these clots of blood and flesh, which would occasionally pierce through the pores of the skin, left no mark or trace on the face. Several physicians of eminence have witnessed the case, and one of them, Dr. Shuler of Vincennes, writes the following letter to Dr. Mitchell on the subject—*N. Y. Nat. Adv.*

"Enclosed are specimens of bone and cartilage, with a clot, that were taken from the girl's face. I regret I have no more to send to you. I think you will have received some, before this time, from Gen. Evans. The specimens I found are smaller than most that made their appearance. The largest of them owes its whiteness, externally, to having been brushed, and is smoother than most of those which I saw. All the bones had some parts of their surface smooth—but this smoothness was generally on one side. The cartilaginous substances appear when dry, to be of two kinds—the one pale and transparent, and the other yellowish, and more opaque, as you will find by examination. It is probable, I think, if the cartilage and bone were properly analyzed, they would be found to contain a larger proportion of gelatine than the regular bone of the human body—and the yellow places especially, to be composed principally of gelatine. The clot inclosed is not a fair specimen, it being smaller and of a darker colour than most of the others. Many were of a dusky white, and of a fibrous structure. The shades of the hue were various, &c." L. S. SHULER.

Lusus Naturæ.—On Sunday last, a negro woman belonging to Mr. Anthony Waddy of Louisa, was delivered of a still born twin child, after having completed the full period of gestation. This monster has two necks and heads of a perfectly natural appearance, with all the features of the face complete, and as large as those of children usually are at birth.

From the shoulders down, they are united, having but two natural arms and as many legs, with a double arm, arising a little below the place at which the two necks unite to form the shoulders, and terminating at the extremity in a hand having seven fingers. The sternum has a double appearance, though two distinct ones cannot be felt. It has two spines, well marked at their upper extremities, but less distinct at their lower ones. It has a third leg coming off opposite the two natural ones. This is not double any where except the foot, which has seven toes—five coming out in the usual manner, and two arising from the top of the foot. It is a female, was provided with but one cord, and weighed nine pounds at birth It may be seen at the house of Dr. Joseph W. Pendleton, near Cuckooville, Louisa.—*Richmond Enquirer.*

Account of a singular Lusus Naturæ in the Fœtus of a Sheep. By J. Cist. Communicated through Professor Thomas Say.
An ewe belonging to Gen. R. of this county, produced a lamb a few days ago, which, on account of its singular conformation, appears to be worthy of notice.

It weighed four pounds and three quarters. It was altogether destitute of head and fore-parts, as well as tail. The pelt was remarkably thick—the wool coarse, and resembling that of a four months old lamb, instead of the delicate texture of one newly dropt. At one side, at A, there were two small ears, closely connected, which were not larger than those of a rat.

The appearances, upon dissection, were the following:—In the cavity marked B, which was encased in front by a cartilaginous structure resembling the sternum, were enclosed the lungs, the parenchymatous structure being much more solid, however, than usual—there was no external communication with them, nor any thing resembling a trachea.

On a careful examination, there was not the slightest vestige of a heart, nor any thing which could have performed its office, to be observed.

The liver was firm, but unusually small—being not larger than that of a cock.

The intestines seemed to possess no regular organization, and could not be easily traced—they did not terminate in any external opening or anus.

The scrotum, as will be seen by the plate, was of an unusual size, enclosing two very small testes.

There were no articulations perceptible, except at the hip and hoof—both hoofs were undivided.

The subject being in a state of putrefaction before it came to the notice of the writer, rendered further examination difficult and unsatisfactory.

The ewe dropt, about the same time, an ordinary sized lamb, which is now alive, but with a defect of the bony structure of the left hind leg.

The process of parturition occupied about twenty-four hours, and left the ewe greatly exhausted.

Luzerne County, Penn. April 3d, 1824.

SINGULAR MONSTROSITY; the FŒTUS of A SHEEP.

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Annex